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Yuasa

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(54) **AUTOMATED TRANSACTION APPARATUS, AUTOMATED TRANSACTION METHOD, AND PROGRAM STORAGE MEDIUM**

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G07D 11/00 (2006.01)

(52) **U.S. Cl.**
CPC ***G07D 11/0051*** (2013.01)

(58) **Field of Classification Search**
CPC G06Q 10/00; G06Q 20/00; G06Q 30/00; G06Q 40/00; G07D 11/051
USPC 705/3–44
See application file for complete search history.

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(57) **ABSTRACT**

An automated transaction apparatus is disclosed, which includes an identification section that, when a plurality of types of currency having mutually different currency units have been inserted, identifies the inserted currency; and a controller that effects control of a transaction with a user based on identification results determined by the identification section.

16 Claims, 14 Drawing Sheets

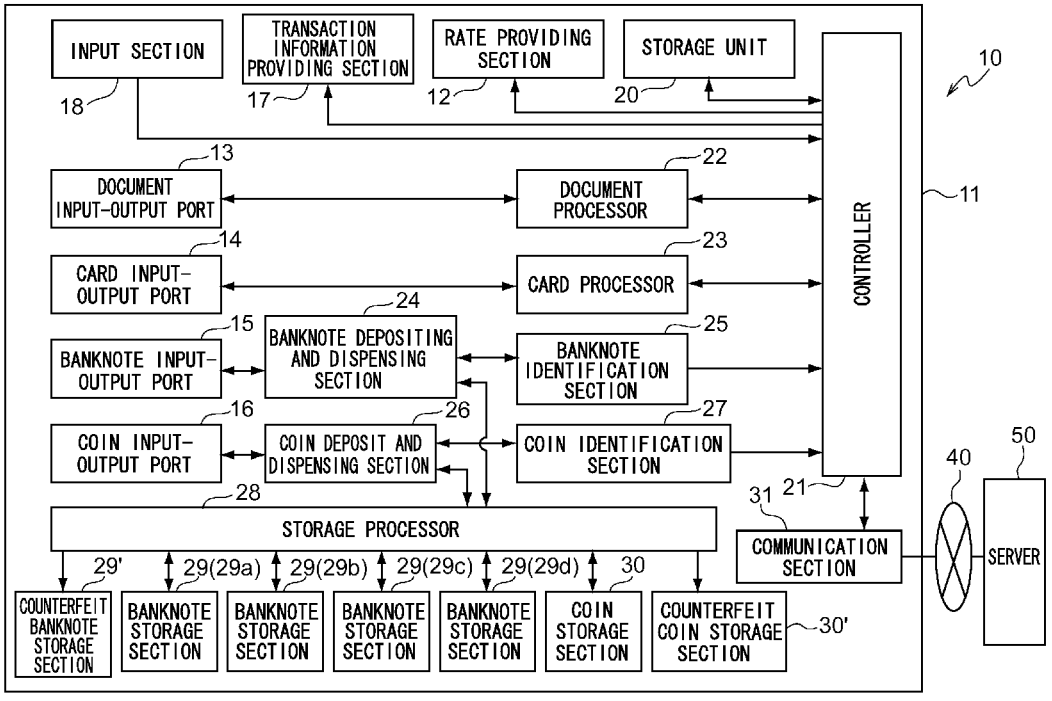


FIG.1

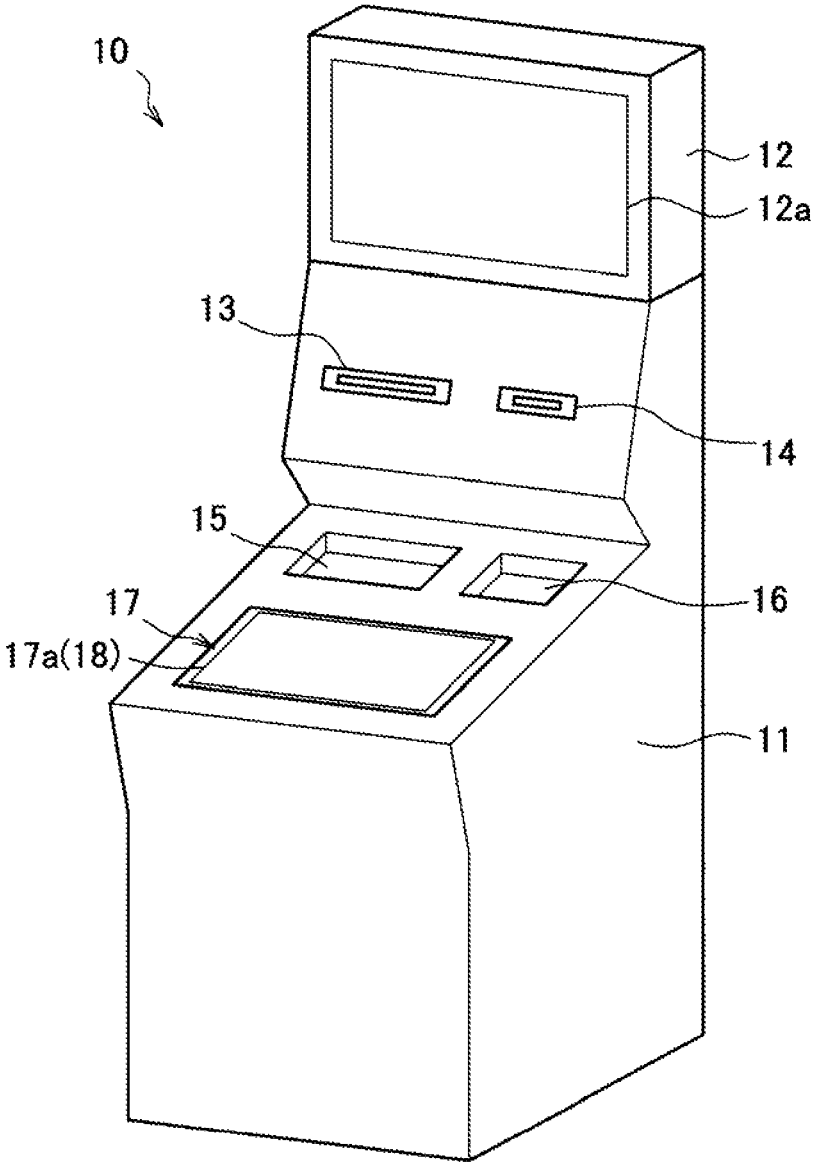


FIG.2

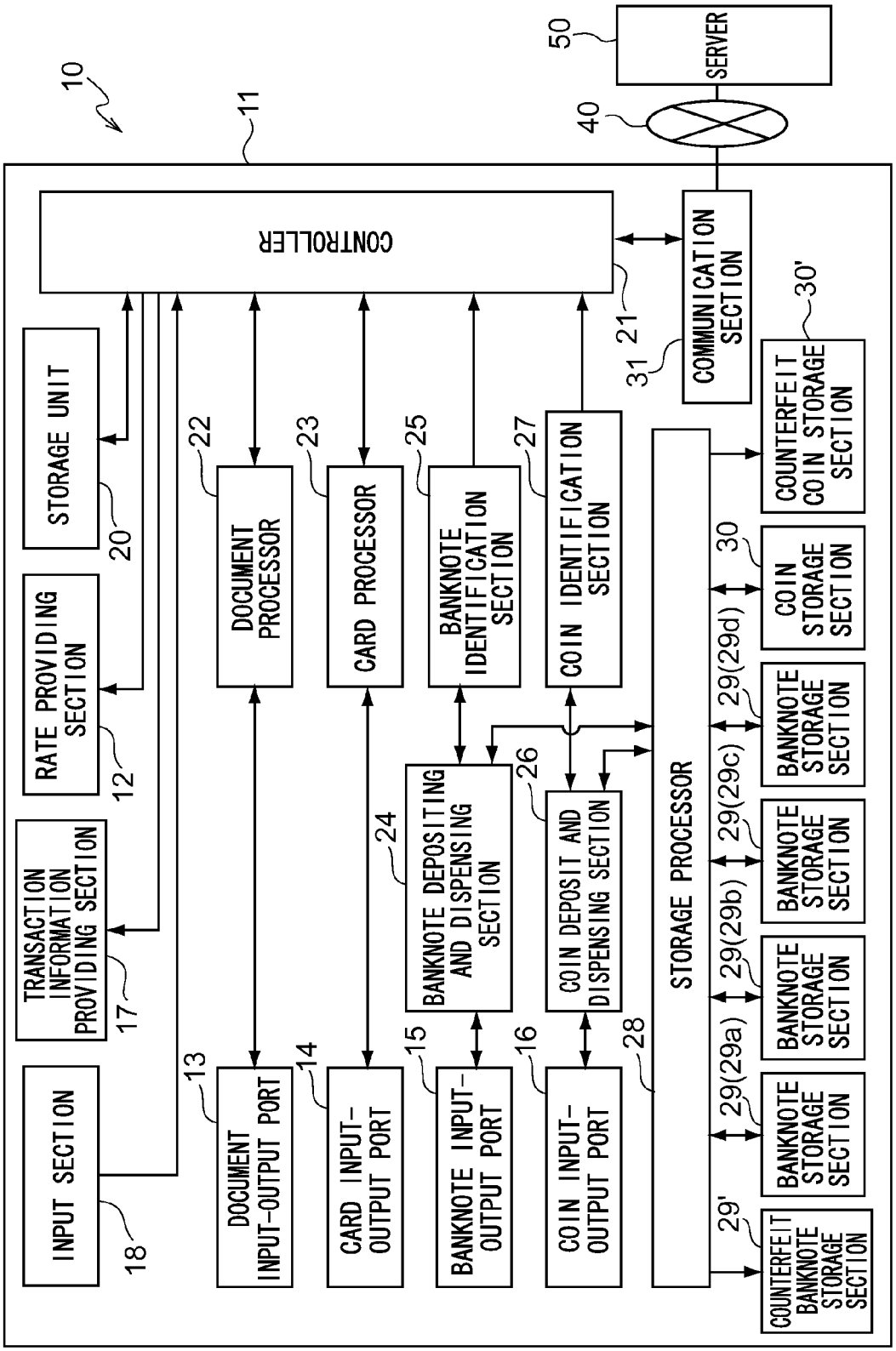

10
11
50
SERVER
40
CONTROLLER
21
COMMUNICATION SECTION
31
30'
COUNTERFEIT COIN STORAGE SECTION
STORAGE UNIT
20
RATE PROVIDING SECTION
12
TRANSACTION INFORMATION PROVIDING SECTION
17
INPUT SECTION
18
22
DOCUMENT PROCESSOR
23
CARD PROCESSOR
25
BANKNOTE IDENTIFICATION SECTION
27
COIN IDENTIFICATION SECTION
13
DOCUMENT INPUT-OUTPUT PORT
14
CARD INPUT-OUTPUT PORT
24
15
BANKNOTE INPUT-OUTPUT PORT
BANKNOTE DEPOSITING AND DISPENSING SECTION
26
16
COIN INPUT-OUTPUT PORT
COIN DEPOSIT AND DISPENSING SECTION
28
STORAGE PROCESSOR
29(29d)
30
COIN STORAGE SECTION
29(29c)
BANKNOTE STORAGE SECTION
29(29b)
BANKNOTE STORAGE SECTION
29(29a)
BANKNOTE STORAGE SECTION
29'
COUNTERFEIT BANKNOTE STORAGE SECTION

FIG.3

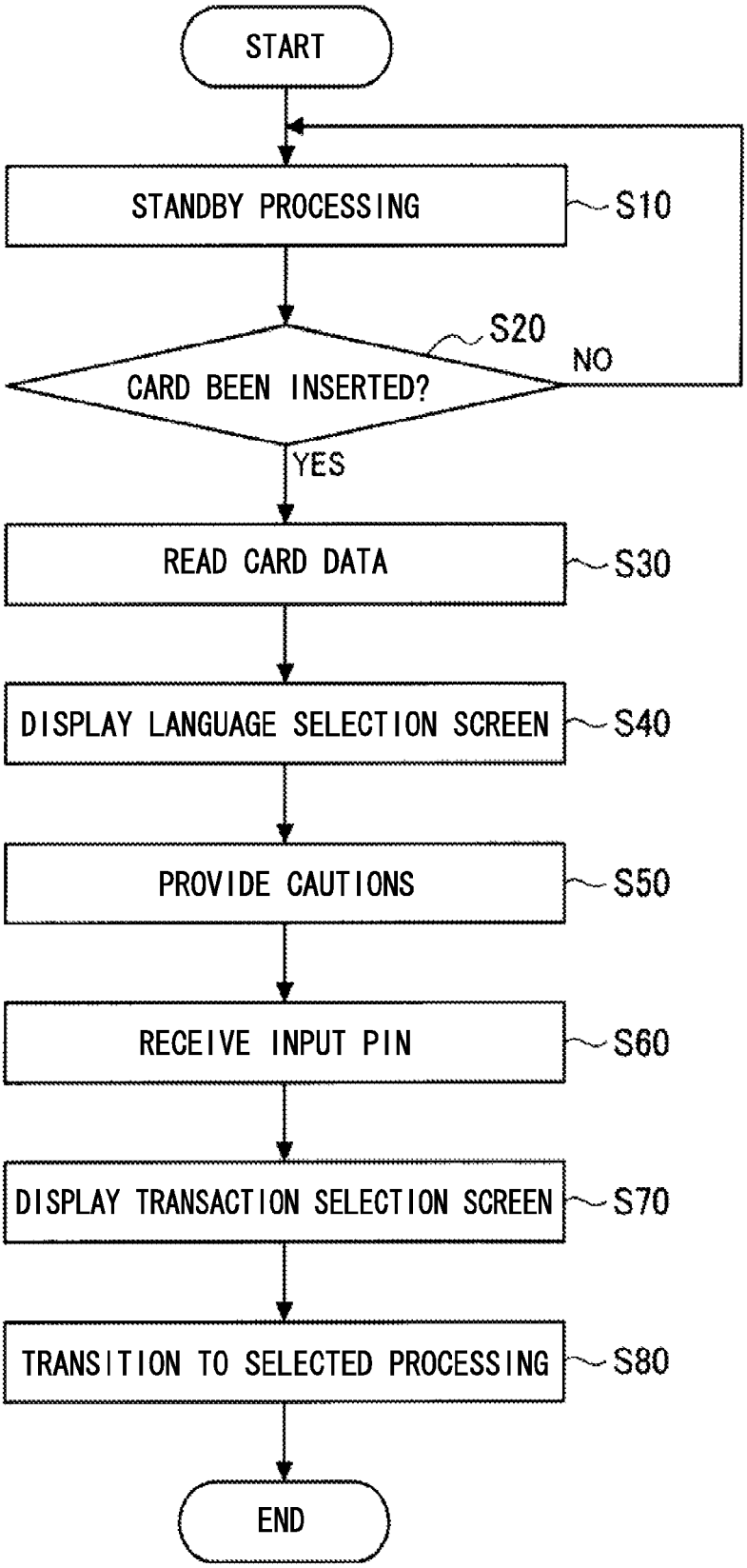

START
STANDBY PROCESSING
S10
S20
CARD BEEN INSERTED?
NO
YES
READ CARD DATA
S30
DISPLAY LANGUAGE SELECTION SCREEN
S40
PROVIDE CAUTIONS
S50
RECEIVE INPUT PIN
S60
DISPLAY TRANSACTION SELECTION SCREEN
S70
TRANSITION TO SELECTED PROCESSING
S80
END

FIG.4

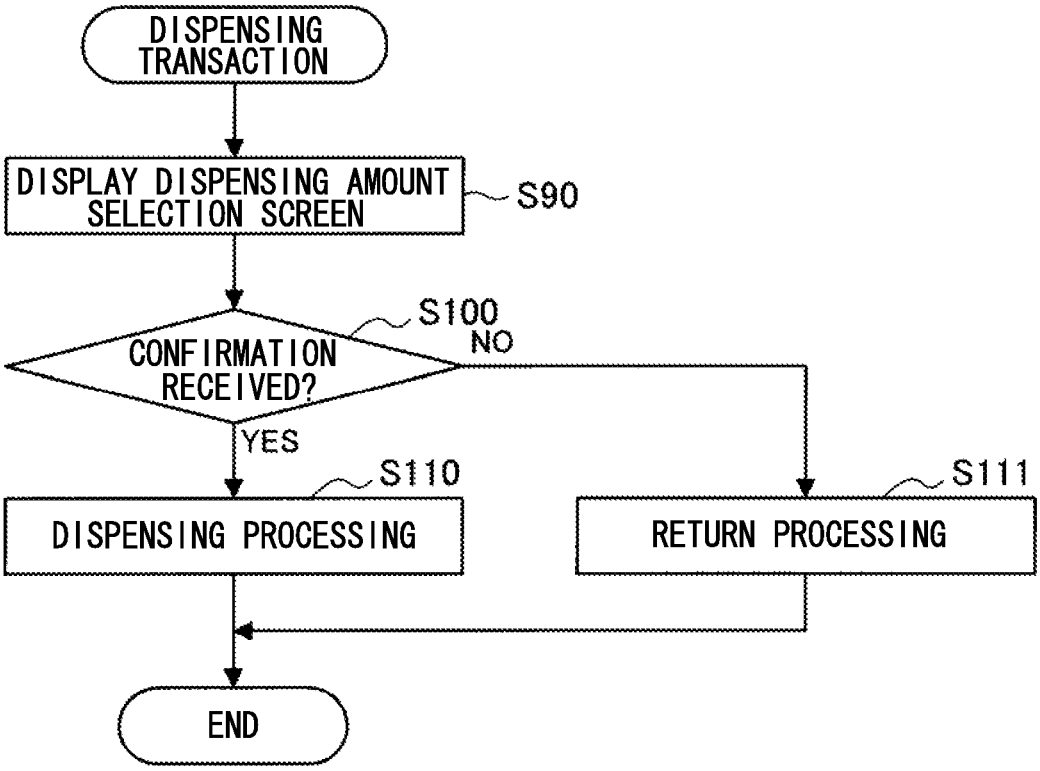

DISPENSING TRANSACTION
DISPLAY DISPENSING AMOUNT SELECTION SCREEN
S90
S100
CONFIRMATION RECEIVED?
NO
YES
S110
DISPENSING PROCESSING
S111
RETURN PROCESSING
END

FIG.5

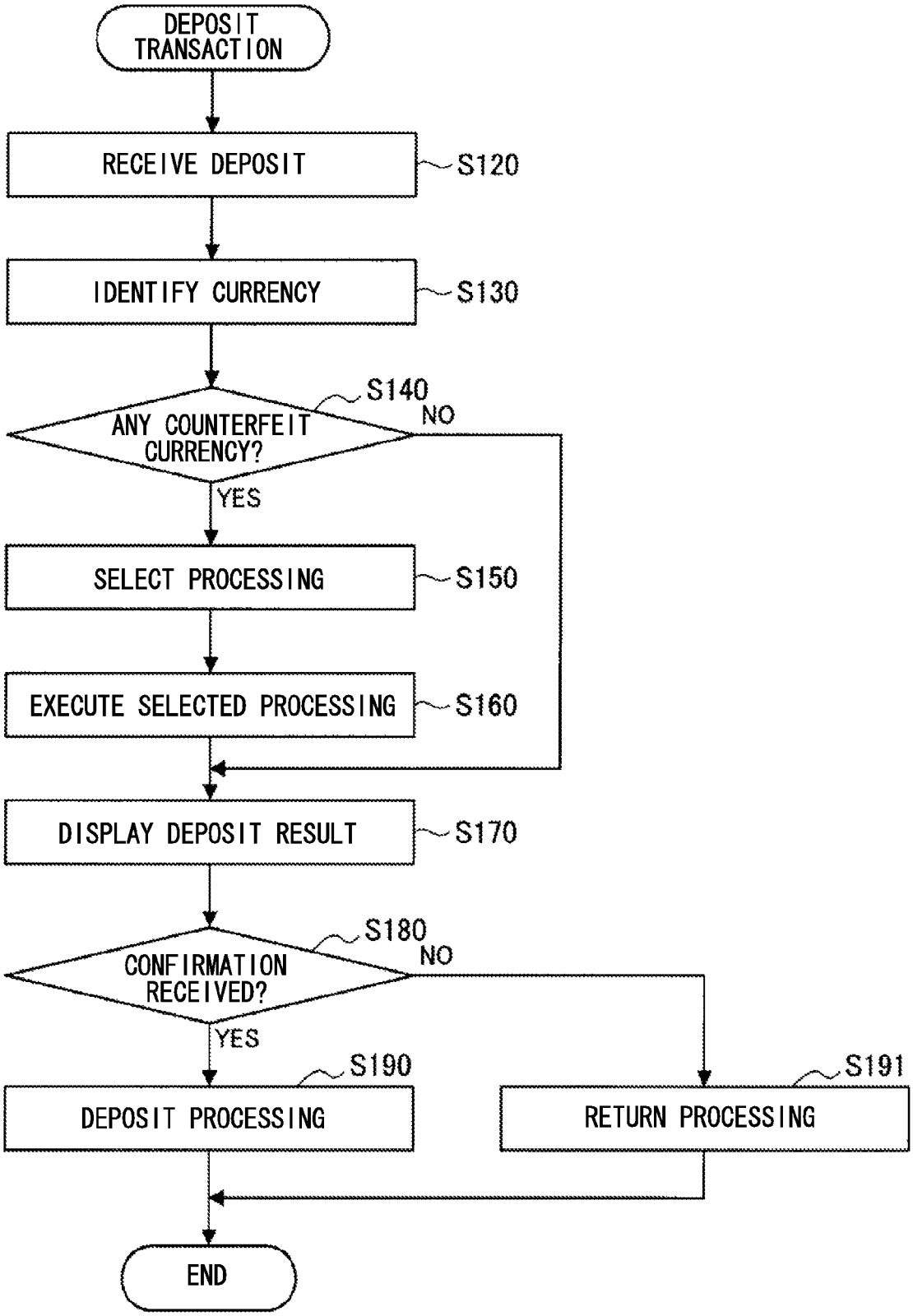

DEPOSIT TRANSACTION
RECEIVE DEPOSIT
S120
IDENTIFY CURRENCY
S130
S140
ANY COUNTERFEIT CURRENCY?
NO
YES
SELECT PROCESSING
S150
EXECUTE SELECTED PROCESSING
S160
DISPLAY DEPOSIT RESULT
S170
S180
CONFIRMATION RECEIVED?
NO
YES
S190
DEPOSIT PROCESSING
S191
RETURN PROCESSING
END

FIG.6

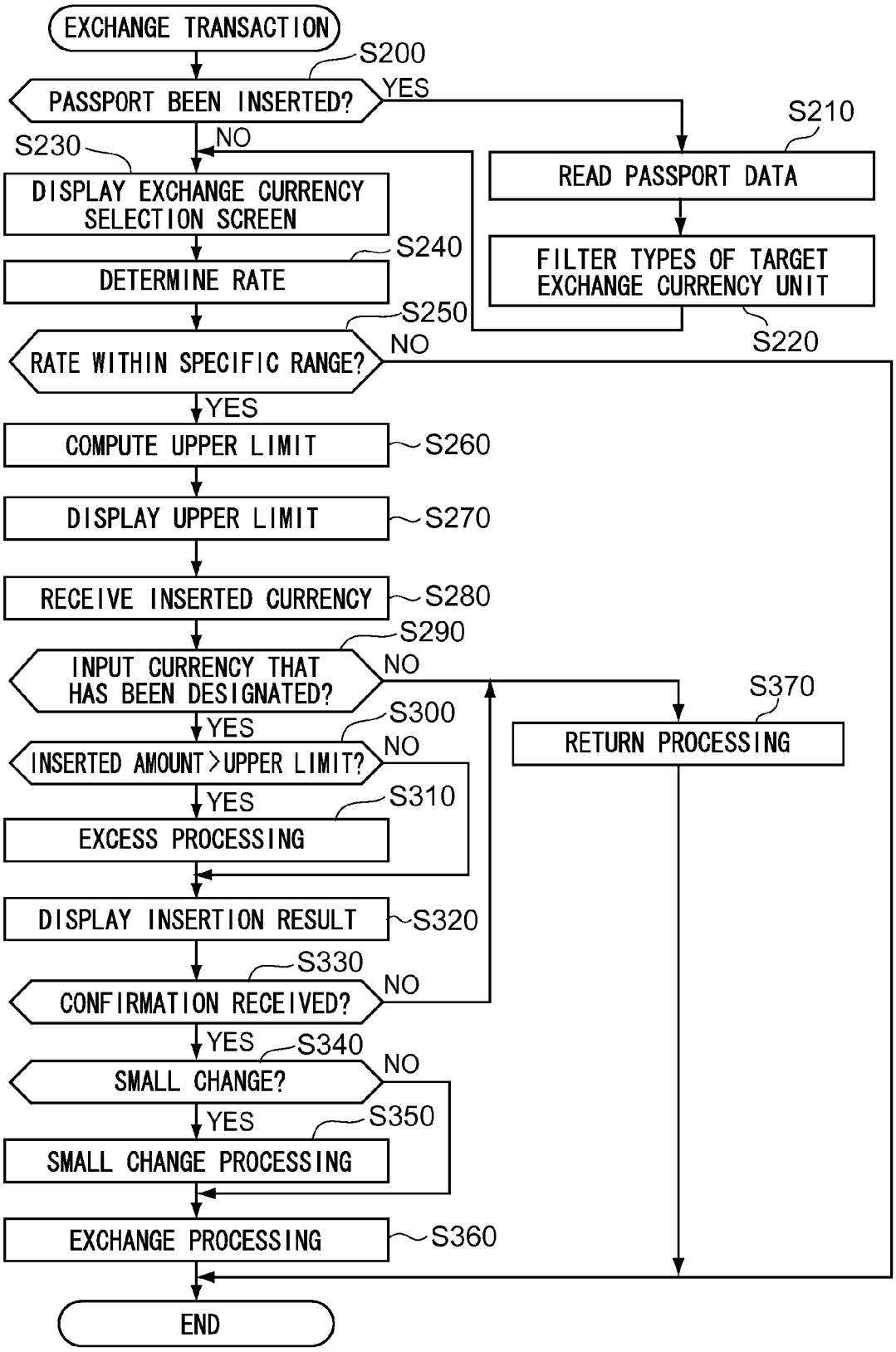

EXCHANGE TRANSACTION
S200
PASSPORT BEEN INSERTED?
YES
NO
S210
READ PASSPORT DATA
FILTER TYPES OF TARGET EXCHANGE CURRENCY UNIT
S220
S230
DISPLAY EXCHANGE CURRENCY SELECTION SCREEN
S240
DETERMINE RATE
S250
RATE WITHIN SPECIFIC RANGE?
NO
YES
COMPUTE UPPER LIMIT
S260
DISPLAY UPPER LIMIT
S270
RECEIVE INSERTED CURRENCY
S280
S290
INPUT CURRENCY THAT HAS BEEN DESIGNATED?
NO
S370
RETURN PROCESSING
YES
S300
INSERTED AMOUNT>UPPER LIMIT?
NO
YES
S310
EXCESS PROCESSING
DISPLAY INSERTION RESULT
S320
S330
CONFIRMATION RECEIVED?
NO
YES
S340
SMALL CHANGE?
NO
YES
S350
SMALL CHANGE PROCESSING
EXCHANGE PROCESSING
S360
END

FIG.7

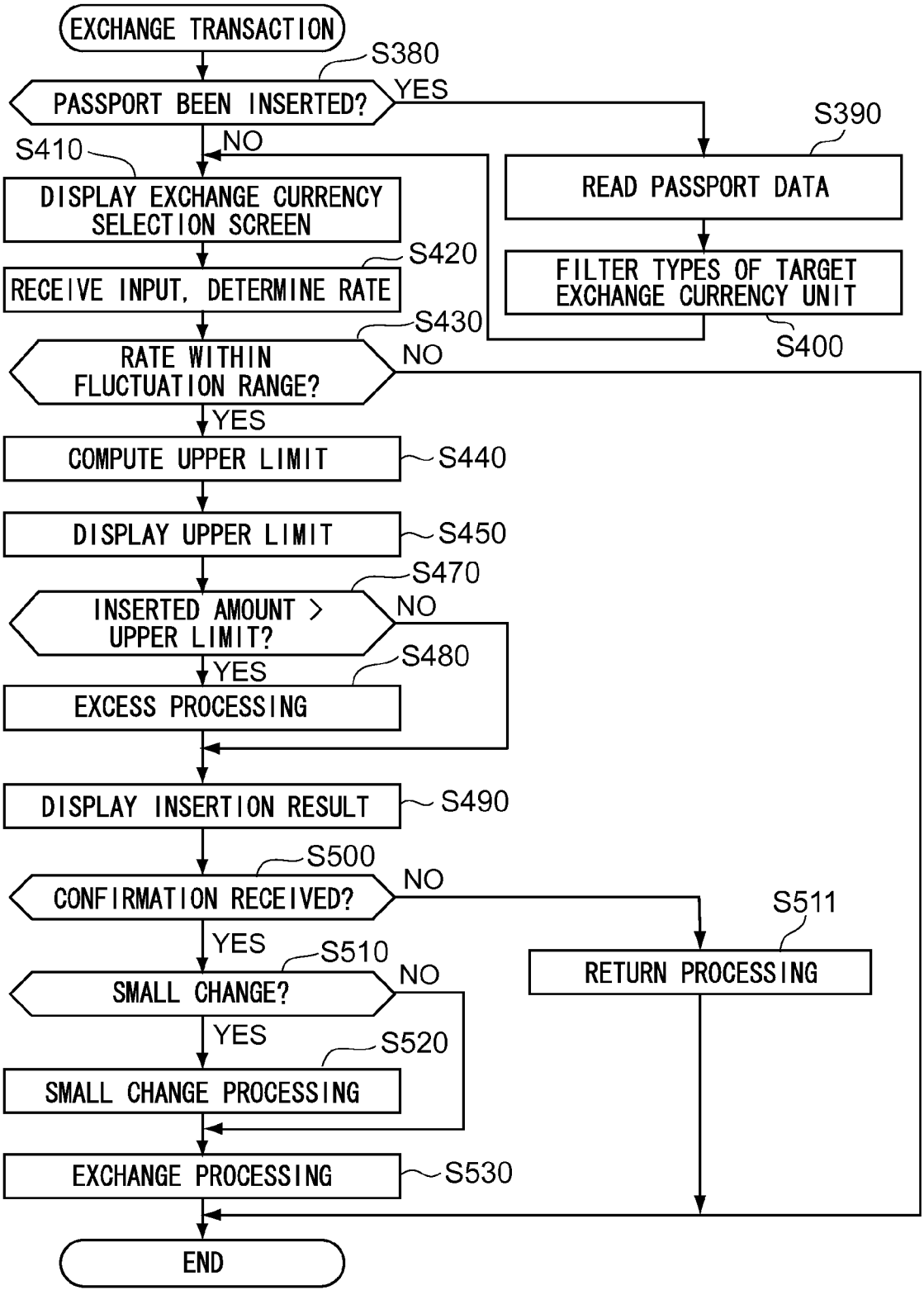

EXCHANGE TRANSACTION
S380
PASSPORT BEEN INSERTED?
YES
NO
S390
READ PASSPORT DATA
FILTER TYPES OF TARGET EXCHANGE CURRENCY UNIT
S400
S410
DISPLAY EXCHANGE CURRENCY SELECTION SCREEN
S420
RECEIVE INPUT, DETERMINE RATE
S430
RATE WITHIN FLUCTUATION RANGE?
NO
YES
COMPUTE UPPER LIMIT
S440
DISPLAY UPPER LIMIT
S450
S470
INSERTED AMOUNT > UPPER LIMIT?
NO
YES
S480
EXCESS PROCESSING
DISPLAY INSERTION RESULT
S490
S500
CONFIRMATION RECEIVED?
NO
S511
RETURN PROCESSING
YES
S510
SMALL CHANGE?
NO
YES
S520
SMALL CHANGE PROCESSING
EXCHANGE PROCESSING
S530
END

FIG.8

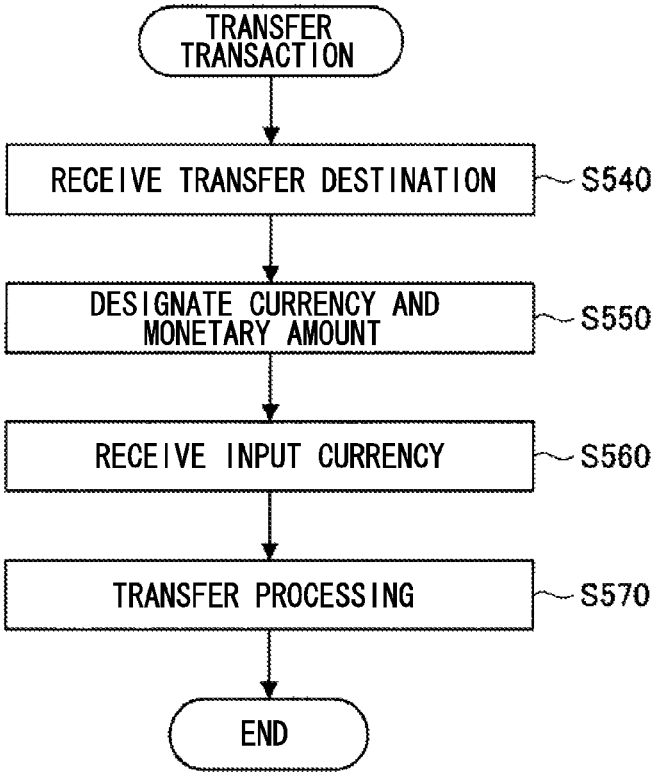

TRANSFER TRANSACTION
RECEIVE TRANSFER DESTINATION
S540
DESIGNATE CURRENCY AND MONETARY AMOUNT
S550
RECEIVE INPUT CURRENCY
S560
TRANSFER PROCESSING
S570
END

FIG.9

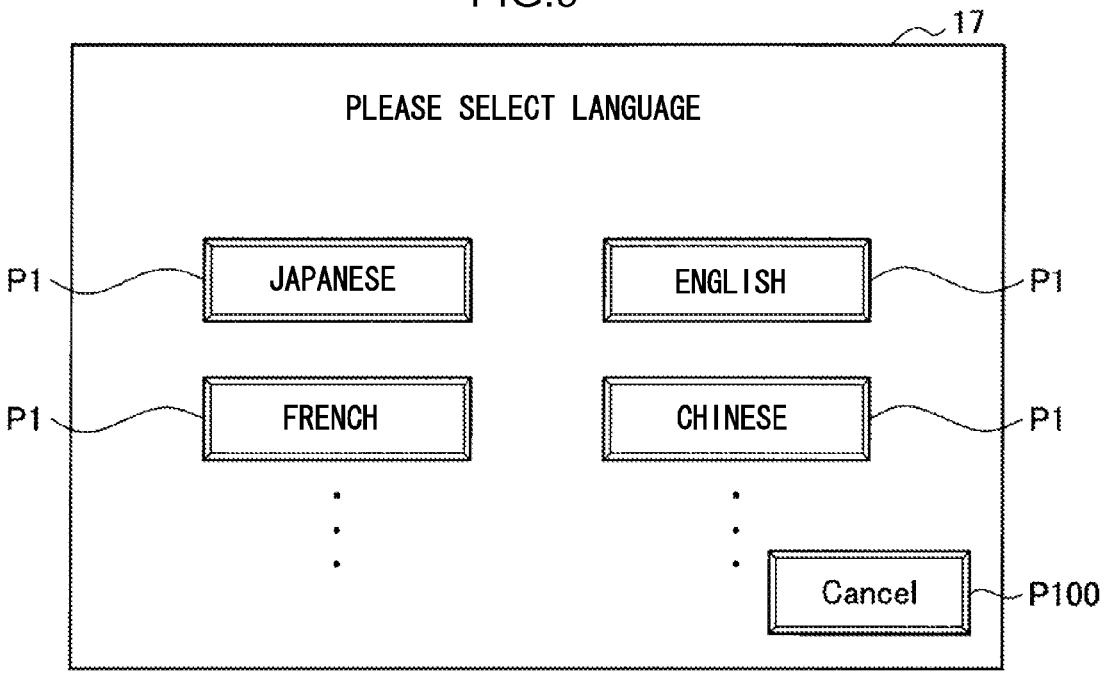

17
PLEASE SELECT LANGUAGE
P1
JAPANESE
ENGLISH
P1
P1
FRENCH
CHINESE
P1
Cancel
P100

FIG.10

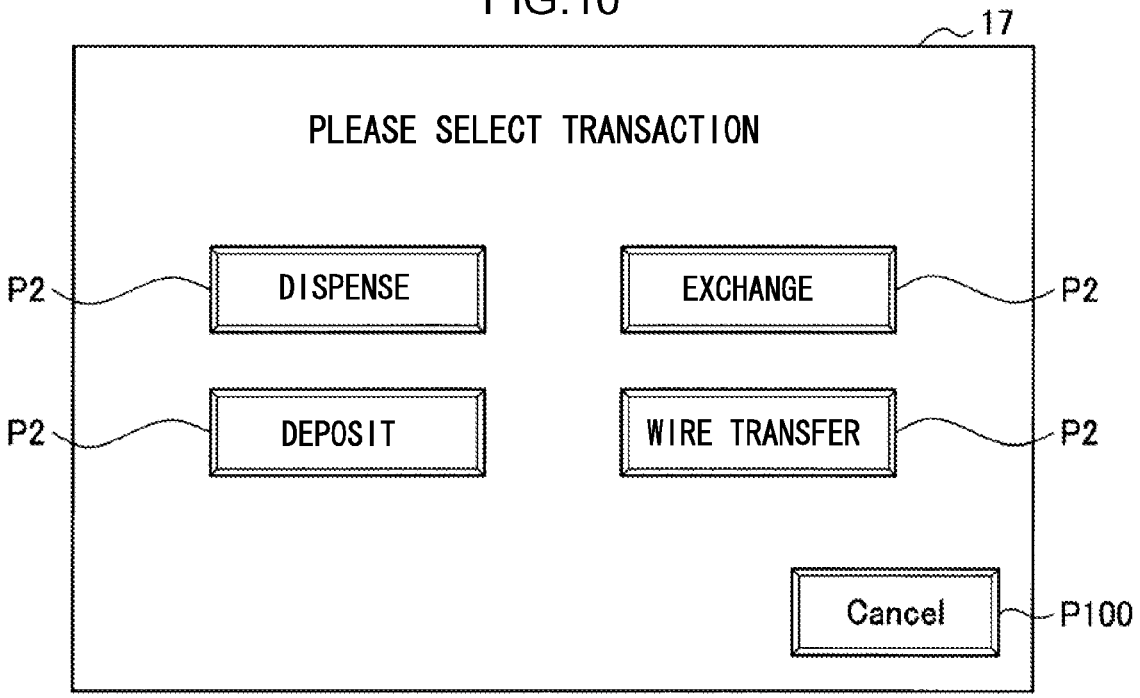

17
PLEASE SELECT TRANSACTION
P2
DISPENSE
EXCHANGE
P2
P2
DEPOSIT
WIRE TRANSFER
P2
Cancel
P100

FIG.11

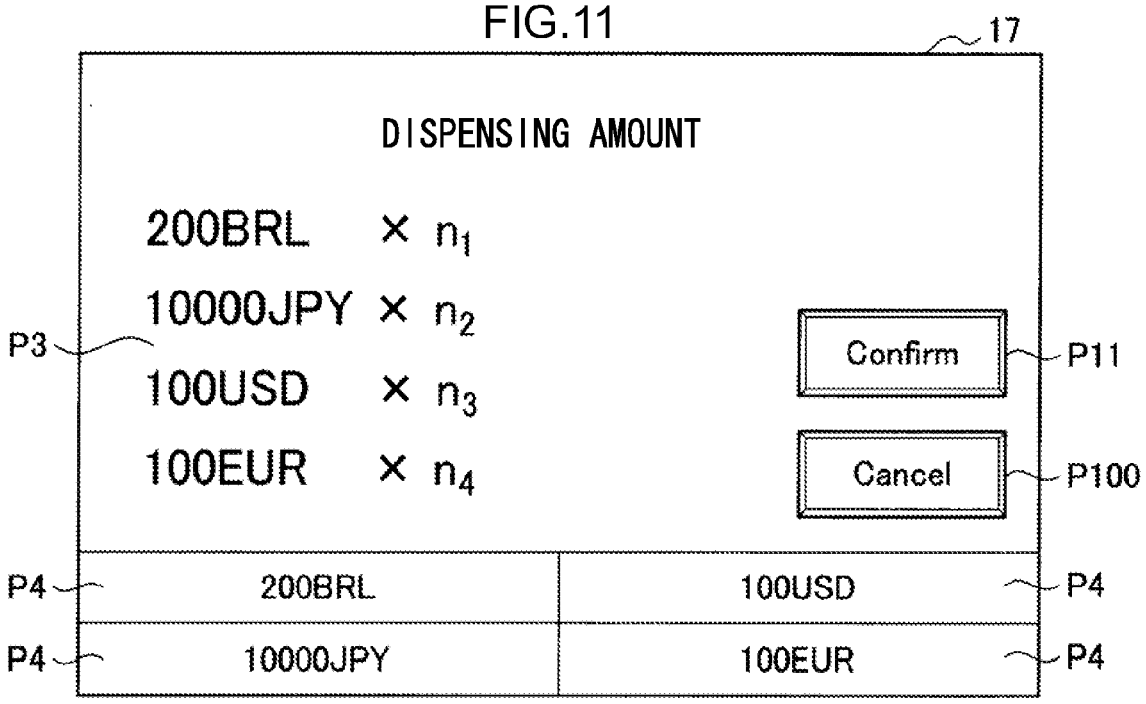

17
DISPENSING AMOUNT
200BRL × n_1
10000JPY × n_2
100USD × n_3
100EUR × n_4
P3
Confirm
P11
Cancel
P100
P4
200BRL
100USD
P4
P4
10000JPY
100EUR
P4

FIG.12

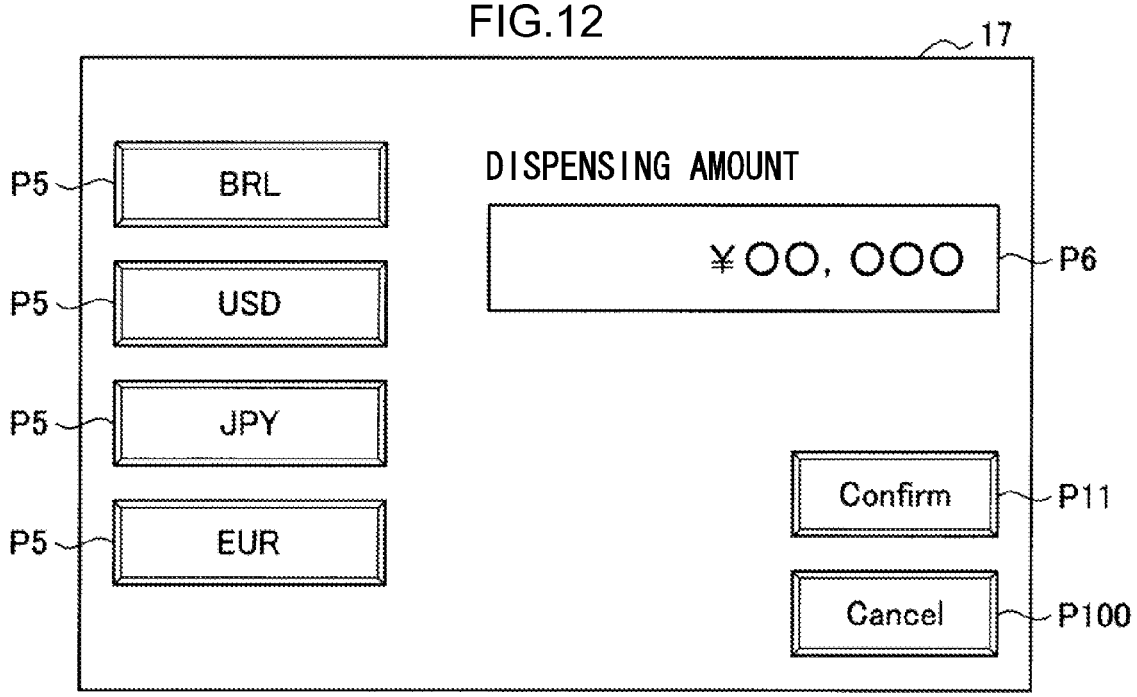

17
P5
BRL
P5
USD
P5
JPY
P5
EUR
DISPENSING AMOUNT
¥OO, OOO
P6
Confirm
P11
Cancel
P100

FIG.13

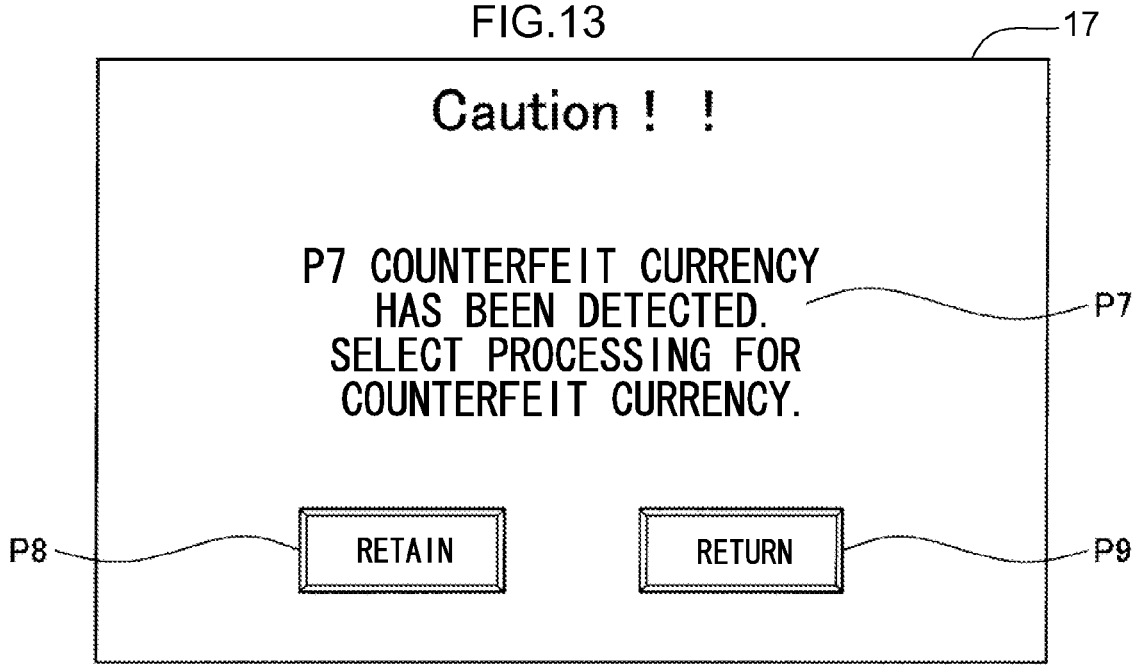

17
Caution ! !
P7 COUNTERFEIT CURRENCY
HAS BEEN DETECTED.
SELECT PROCESSING FOR
COUNTERFEIT CURRENCY.
P7
P8
RETAIN
RETURN
P9

FIG.14

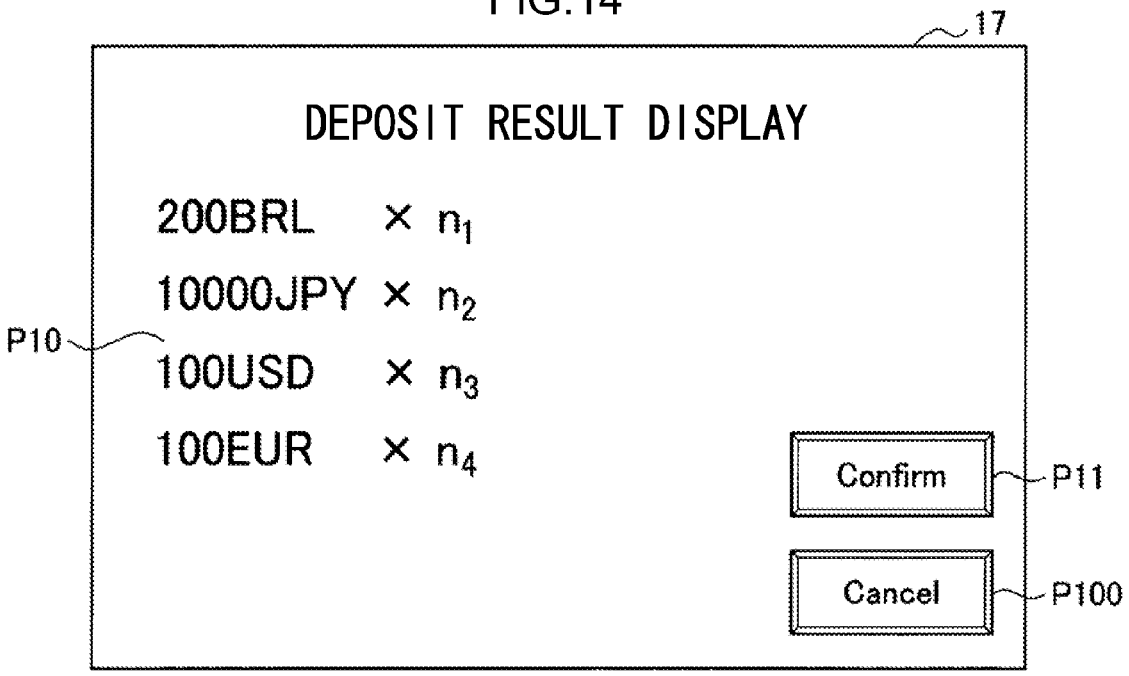

17
DEPOSIT RESULT DISPLAY
200BRL × n_1
10000JPY × n_2
100USD × n_3
100EUR × n_4
P10
Confirm
P11
Cancel
P100

FIG.15

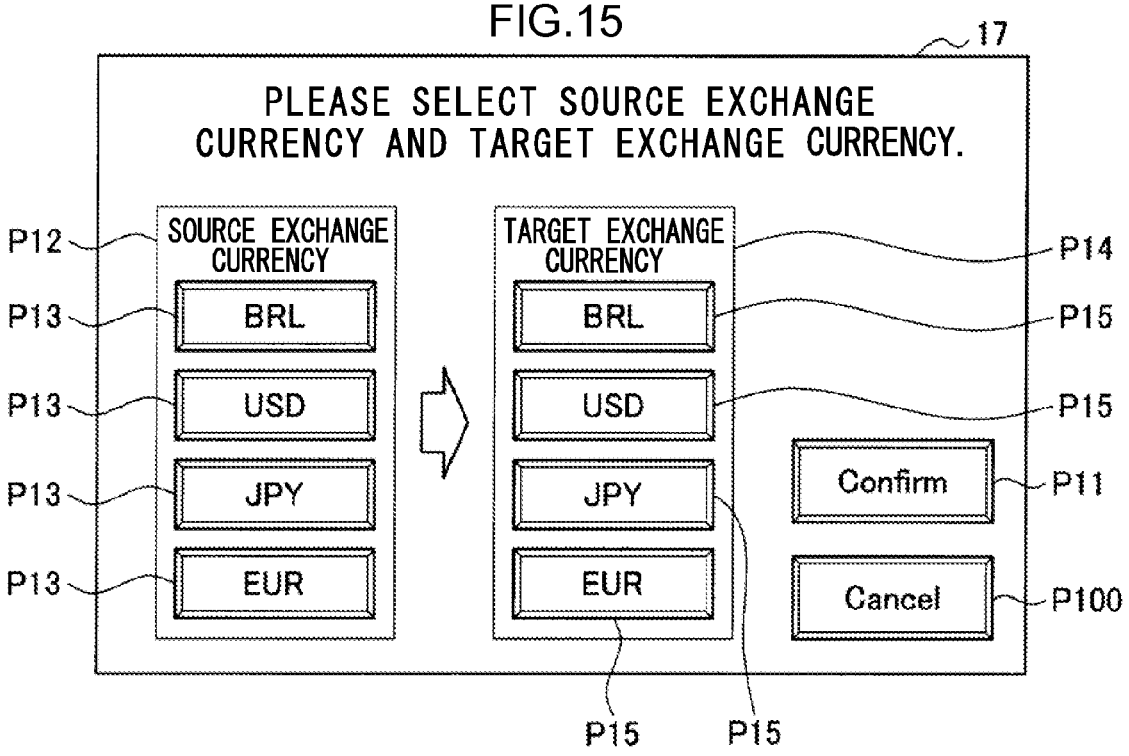

17
PLEASE SELECT SOURCE EXCHANGE CURRENCY AND TARGET EXCHANGE CURRENCY.
P12
SOURCE EXCHANGE CURRENCY
P13
BRL
P13
USD
P13
JPY
P13
EUR
TARGET EXCHANGE CURRENCY
P14
BRL
P15
USD
P15
JPY
EUR
P15
P15
Confirm
P11
Cancel
P100

FIG.16

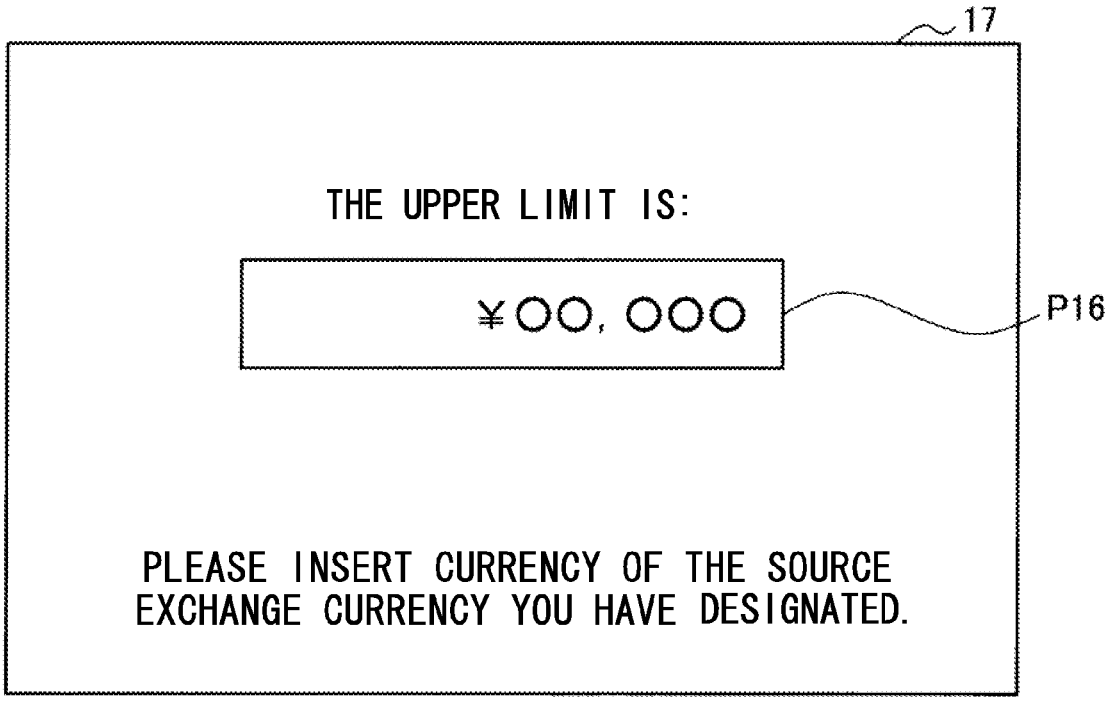

17
THE UPPER LIMIT IS:
¥OO,OOO
P16
PLEASE INSERT CURRENCY OF THE SOURCE
EXCHANGE CURRENCY YOU HAVE DESIGNATED.

FIG.17

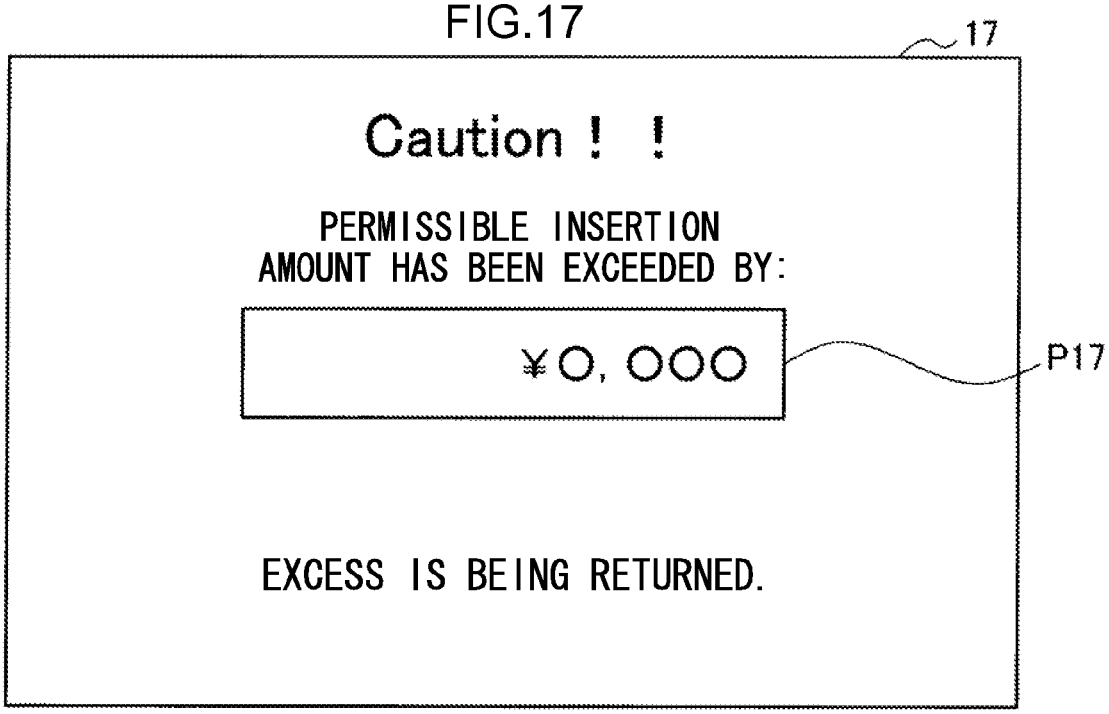

17
Caution ! !
PERMISSIBLE INSERTION
AMOUNT HAS BEEN EXCEEDED BY:
¥O,OOO
P17
EXCESS IS BEING RETURNED.

FIG.18

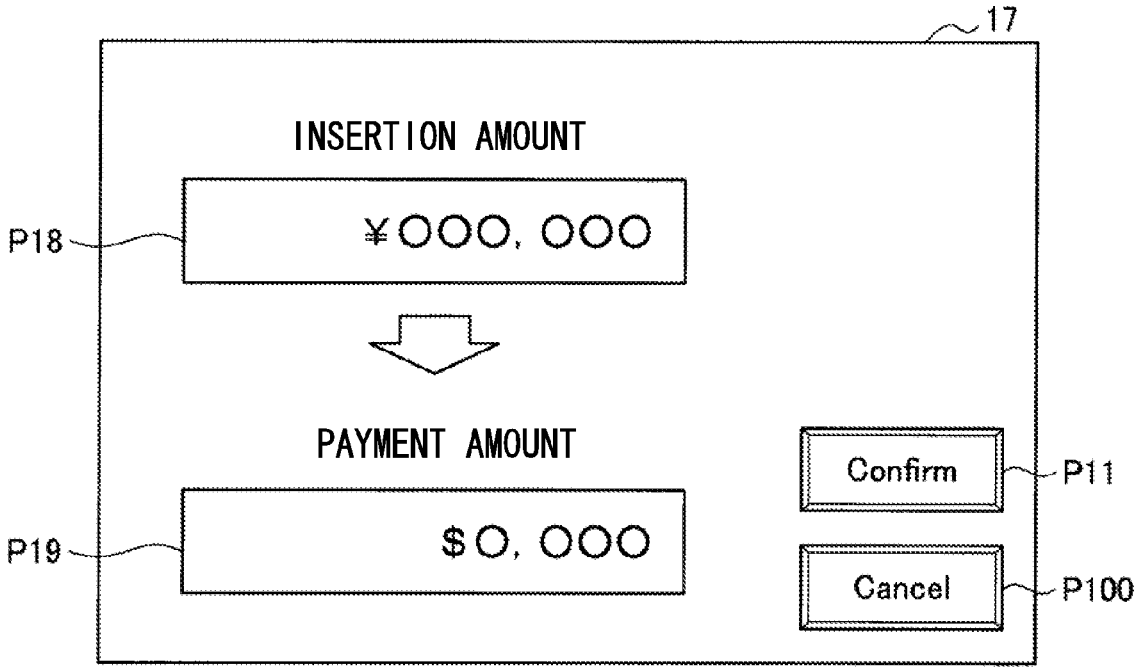

17
INSERTION AMOUNT
P18
¥OOO, OOO
PAYMENT AMOUNT
P19
$O, OOO
Confirm
P11
Cancel
P100

FIG.19

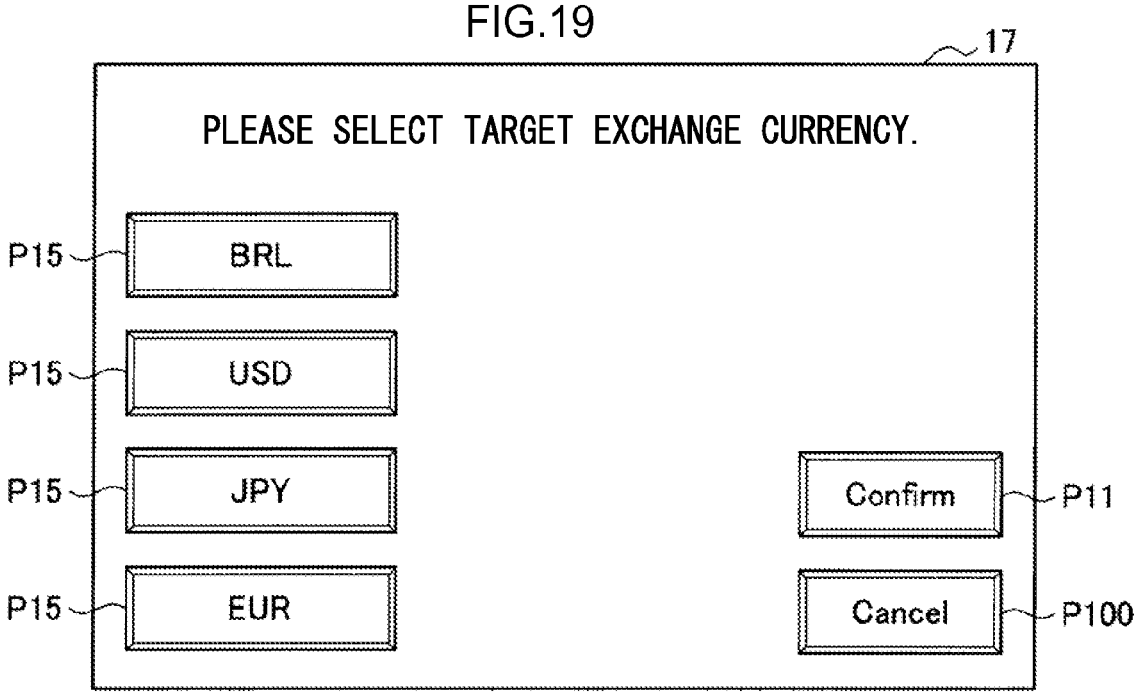
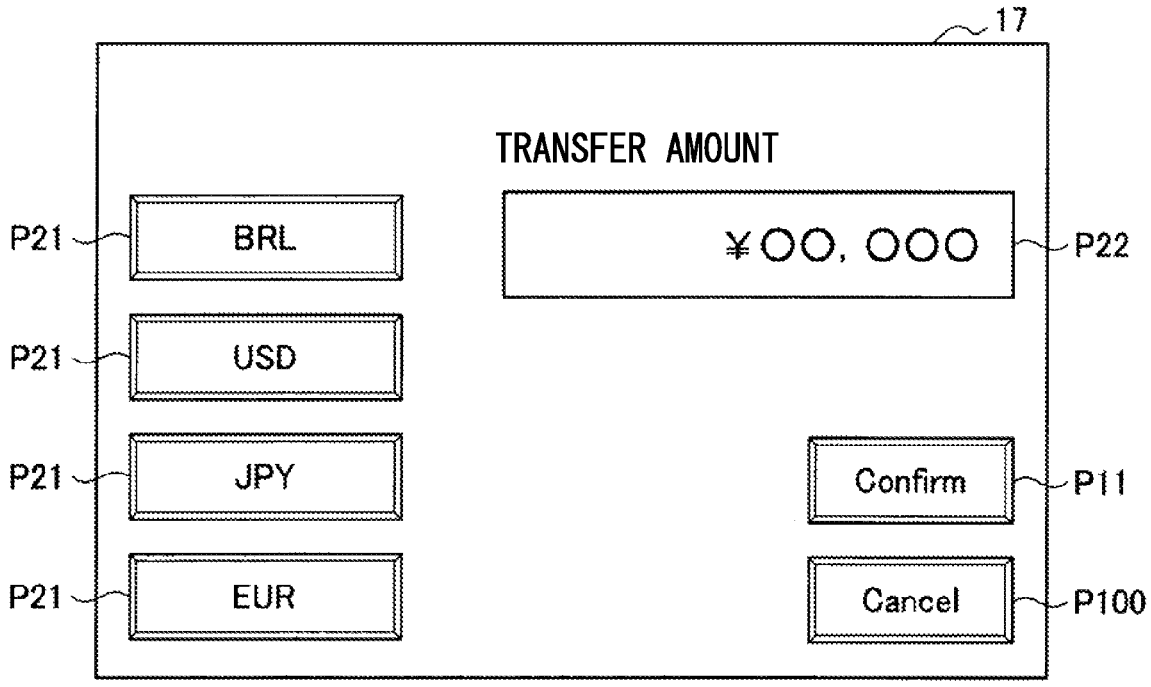

17
PLEASE SELECT TARGET EXCHANGE CURRENCY.
P15
BRL
P15
USD
P15
JPY
P15
EUR
Confirm
P11
Cancel
P100

FIG.20


17
TRANSFER AMOUNT
P21
BRL
¥OO, OOO
P22
P21
USD
P21
JPY
Confirm
P11
P21
EUR
Cancel
P100

AUTOMATED TRANSACTION APPARATUS, AUTOMATED TRANSACTION METHOD, AND PROGRAM STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATION

This application is based on and claims priority under 35 USC 119 from Japanese Patent Application No. 2011-105923 filed on May 11, 2011, the disclosure of which is incorporated by reference herein.

BACKGROUND

1. Technical Field

The present invention relates to an automated transaction apparatus, an automated transaction process, and a program stored medium storing automated transaction program.

2. Description of the Related Art

As described in, for example, Japanese Patent Laid-Open (JP-A) No. 2011-053802, automated transaction apparatuses capable of transactions using currency, for example cash, have become commonplace. Such automated transaction apparatuses identify currency inserted by a user, and perform transactions with the user based on the identification results.

However, conventionally such automated transaction apparatuses have been unable to identify more than a single currency unit. For example, automated transaction apparatuses installed in Japan are unable to identify currencies other than the Japanese yen. Consequently, there is a limitation to the types of currency with which previous automated transaction apparatuses are able to perform transactions.

SUMMARY

In consideration of the above circumstances, the present invention provides an automated transaction apparatus, automated transaction method, and program stored medium storing automated transaction program enabling transactions to be performed in more currencies than conventionally.

A first aspect of the present invention provides an automated transaction apparatus including: an identification section that, after a plurality of types of currency having mutually different currency units have been inserted, identifies the inserted currency; and a controller that effects control of a transaction with a user based on identification results determined by the identification section.

The first aspect may be configured such that the identification section ascertains whether or not the inserted currency is counterfeit currency; and the controller determines a type of processing for the counterfeit currency based on the currency unit of the counterfeit currency if the inserted currency has been ascertained to be counterfeit currency.

Configuration may also be made such that based on the currency unit, the controller effects control to determine the type of processing for the counterfeit currency as either: returning the counterfeit currency to the user; or retaining the counterfeit currency in a counterfeit currency storage section for storing counterfeit currency.

Configuration may also be made such that if the currency unit of the counterfeit currency is the euro, the controller determines the type of processing for the counterfeit currency as retaining the counterfeit currency in the counterfeit currency storage section.

Configuration may also be made to further include a storage unit that stores a counterfeit currency processing table in which currency units of counterfeit currencies are stored in association with types of processing for each of the currency units of counterfeit currencies.

Configuration may also be made such that the controller determines the type of processing for the counterfeit currency based on the counterfeit currency processing table stored by the storage unit.

Configuration may also be made here such that the identification section ascertains whether or not the inserted currency is counterfeit currency, and if the inserted currency has been ascertained to be counterfeit currency, the controller effects control of allowing the user to select whether the counterfeit currency is returned to the user, or the counterfeit currency is retained in the counterfeit currency storage section.

Configuration may also be made such that the controller effects control to exchange the inserted currency for a target exchange currency that is currency of a different currency unit to the currency unit of the inserted currency; and, if the user is to be paid coins for at least a portion of the target exchange currency, effects control to provide the user with a recording medium on which data relating to the monetary amount to be paid in coins is recorded.

Configuration may also be made such that the controller computes an input upper limit of the inserted currency based on a payout upper limit that is an upper limit for possible payouts of the target exchange currency and is based on a rate of the target exchange currency against the inserted currency; and, if a monetary amount of the inserted currency exceeds the input upper limit, effects control to cancel exchange of at least a portion of the inserted currency that exceeds the input upper limit.

Configuration may also be made such that the controller effects control to present the input upper limit to the user.

A second aspect of the present invention provides an automated transaction method including: after a plurality of types of currency with mutually different currency units for different usable regions have been inserted, identifying the inserted currency; and controlling a transaction with a user based on a result of the identification.

A third aspect of the present invention is a non-transitory storage medium that stores a program causing a computer to execute automated transaction processing, the automated transaction processing including: after a plurality of types of currency with mutually different currency units for different usable regions have been inserted, identifying the inserted currency; and controlling a transaction with a user based on a result of the identification.

According to the present aspects described above, transactions can be performed in more currencies than previously.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the present invention will be described in detail based on the following figures, wherein:

FIG. **1** is a perspective view illustrating an automated transaction apparatus according to an exemplary embodiment;

FIG. **2** is a block chart illustrating an internal configuration of the automated transaction apparatus according to the exemplary embodiment;

FIG. **3** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **4** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **5** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **6** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **7** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **8** is a flowchart illustrating a processing sequence according to the automated transaction apparatus;

FIG. **9** is an example of a screen (screen image) displayed by the automated transaction apparatus;

FIG. **10** is an example of a screen displayed by the automated transaction apparatus;

FIG. **11** is an example of a screen displayed by the automated transaction apparatus;

FIG. **12** is an example of a screen displayed by the automated transaction apparatus;

FIG. **13** is an example of a screen displayed by the automated transaction apparatus;

FIG. **14** is an example of a screen displayed by the automated transaction apparatus;

FIG. **15** is an example of a screen displayed by the automated transaction apparatus;

FIG. **16** is an example of a screen displayed by the automated transaction apparatus

FIG. **17** is an example of a screen displayed by the automated transaction apparatus;

FIG. **18** is an example of a screen displayed by the automated transaction apparatus;

FIG. **19** is an example of a screen displayed by the automated transaction apparatus; and

FIG. **20** is an example of a screen displayed by the automated transaction apparatus.

DETAILED DESCRIPTION

Detailed explanation follows regarding exemplary embodiments, with reference to the attached drawings. Elements in the present specification and the drawings that have substantially the same functional configuration are appended with the same reference numerals and further explanation thereof is omitted.

1. Automated Transaction Apparatus Configuration

External Configuration of Automatic Transaction Apparatus

Explanation will be first given regarding the external configuration of an automated transaction apparatus **10**, with reference to FIG. **1**. As shown in FIG. **1**, the external configuration of the automated transaction apparatus **10** includes a casing **11**, a rate providing section **12**, a document input-output port **13**, a card input-output port **14**, a banknote input-output port **15**, a coin input-output port **16**, a transaction information providing section **17**, and an input section **18**.

The casing **11** internally houses various configuration elements, such as a controller **21**, as illustrated in FIG. **2**. The rate providing section **12** includes a display **12***a* and a speaker, not shown in the drawings, and provides rates for each currency, by using for example US dollars (USD) as a reference currency. Namely, the rate providing section **12** displays a rate for each currency unit on the display **12***a* and employs the speaker, which is not shown in the drawings, to output speech with the rate for each currency unit. The rate for each currency unit is given as a rate against US dollars, for example, i.e., a monetary amount in the each currency unit against a unit amount of US dollars (=1 US dollar). For example a rate for Japanese yen is given as "1 US dollar=xx yen". Consequently, the rate providing section **12** provides the Japanese yen (JPY) rate by displaying "1 US dollar=xx yen" as text information on a screen and by speech output. Note that the rate may be provided by just one of screen display or speech output. The "rate of currency unit B against currency unit A" means the "monetary amount of currency unit B for a unit amount of currency unit A".

The rate providing section **12** provides historical rates for each currency (for example over the preceding week). The rate providing section **12** provides different rates according to the installation location (for example, airport or town) of the automated transaction apparatus **10**. Namely, the rate providing section **12** provides different rates according to the installation location of the respective automated transaction apparatuses **10** even when installations are within a region (for example a country or community region) in which there is a common currency unit in circulation. Note that configuration may be made such that the rates are provided on the transaction information providing section **17**. In such cases, the transaction information providing section **17** may be configured to provide the rates during idling (during a standby state prior to starting a transaction).

The document input-output port **13** is an input-output port for documents. A user may insert a document through the document input-output port **13**. The document is also ejected from the document input-output port **13**. Examples of documents include a passbook, a passport, a receipt and the like. Such a receipt may be issued according to the result of a transaction with the automated transaction apparatus **10**.

The card input-output port **14** is an inlet and outlet for cards. The user may insert a card through the card input-output port **14**. The card is also ejected from the card input-output port **14**. Such cards are cards that function as storage media that are storable with various types of data. Examples of such cards include cash cards, prepaid cards and the like.

The banknote input-output port **15** is an inlet and outlet for banknotes, and the coin input-output port **16** is an inlet and outlet for coins. The user can insert plural types of currency having mutually different currency units (for example, Japanese yen and US dollars) in the banknote input-output port **15** and the coin input-output port **16**.

The transaction information providing section **17** includes a display **17***a* and a speaker, which is not shown in the drawings, and provides information according to the progress of a transaction. That is, the transaction information providing section **17** displays information according to transaction progress on the display **17***a*, and outputs information according to the transaction progress as speech using the not-shown speaker. Note that configuration may be made such that information is provided by only one of screen display and speech output. The input section **18** is a touch panel provided on the surface of the display **17***a*. The input section **18** generates operation data according to input operation by the user (for example, a particular position touched) and outputs the operation data to a controller **21**, which will be described later.

Internal Configuration of Automated Transaction Apparatus

Explanation is next given regarding the internal configuration of the automated transaction apparatus **10**, with reference to FIG. **2**. The internal configuration of the automated transaction apparatus **10** includes a storage unit **20**, a controller **21**, a document processor **22**, a card processor **23**, a banknote depositing and dispensing section **24**, a banknote identification section **25**, a coin deposit and dispensing section **26**, a coin identification section **27**, a storage processor **28**, a banknote storage section **29**, a counterfeit banknote storage section **29'**, a coin storage section **30**, a counterfeit coin storage section **30'**, and a communication section **31**.

The storage unit **20** stores various data required in processing with the automated transaction apparatus **10**, such as for example: image data of various images for displaying on the rate providing section **12** and the transaction information providing section **17**; text data for outputting various presentation information and speech with the rate providing section

12 and the transaction information providing section 17; rate data for each currency unit; and programs for execution by the controller 21. The storage unit 20 also stores a counterfeit currency processing table storing currency units of counterfeit currency associated with types of processing for counterfeit currency. The counterfeit currency processing table stores, for example, "retain" in association with "Euro", and stores "return" in association with other currency units. The content of the stored table is obviously not limited thereto.

The controller 21 controls each of the elements of the automated transaction apparatus 10. The controller 21 also controls transactions with users, namely, multi-currency transactions with users, based on data received from the banknote identification section 25 and the coin identification section 27. Examples of such transactions include, for example, deposit transactions, dispensing transactions, transfer transactions and exchange transactions. Details regarding processing of the controller 21 are given later.

The document processor 22 controls opening and closing of the document input-output port 13. The document processor 22 also reads various types of data from documents that have been inserted into the document input-output port 13, and outputs data related to the read contents to the controller 21. The document processor 22 also prints various types of information on documents that have been inserted into the document input-output port 13. The document processor 22 also ejects the documents from the document input-output port 13.

The card processor 23 controls opening and closing of the card input-output port 14. The card processor 23 also reads various types of data from cards inserted into the card input-output port 14, and outputs data relating to the read content to the controller 21. The card processor 23 stores various types of data on cards that have been inserted into the card input-output port 14. The card processor 23 also ejects cards from the card input-output port 14. The card processor 23 also includes a prepaid card storage section that stores prepaid cards. The card processor 23 stores various types of data on prepaid cards according to requests from the controller 21, and issues the prepaid cards to users. Note that such prepaid cards may also be ones already held by the user. In such cases, the controller 21 may be configured to prompt the user to insert a prepaid card when a need arises to store various types of data on the prepaid card.

The banknote depositing and dispensing section 24 controls opening and closing of the banknote input-output port 15 and also conveys inserted banknotes, which have been inserted into the banknote input-output port 15, to the storage processor 28. Namely, the banknote depositing and dispensing section 24 has a banknote conveying path, which is not shown in the drawings, and inserted banknotes are conveyed along the banknote conveying path. The banknote depositing and dispensing section 24 also conveys banknotes that have been placed on the banknote conveying path from the storage processor 28 to the banknote input-output port 15, and ejects the banknotes from the banknote input-output port 15.

The banknote identification section 25 is provided on the banknote conveying path for identifying inserted banknotes. Specifically, the banknote identification section 25 identifies the currency unit and denomination of inserted banknotes. The banknote identification section 25 ascertains the inserted banknotes to be counterfeit banknotes, namely forgeries, when the banknote identification section 25 is unable to identify the currency unit and/or denomination of the inserted banknotes. Configuration may be made such that a counterfeit banknote storage section 29' is disposed in the banknote identification section 25. The banknote identification section 25 outputs identification result data related to the identification results to the controller 21.

The coin deposit and dispensing section 26 controls opening and closing of the coin input-output port 16, and also conveys coins that have been inserted through the coin input-output port 16 to the storage processor 28. Namely, the coin deposit and dispensing section 26 includes a coin conveying path, which is not shown in the drawings, and inserted coins are conveyed on the coin conveying path.

The coin identification section 27 is provided on the coin conveying path for identifying the inserted coins. Specifically, the coin identification section 27 identifies the currency unit and denomination of the inserted coins. The coin identification section 27 ascertains the inserted coins to be counterfeit coins when the coin identification section 27 is unable to identify the currency unit and/or the denomination of the inserted coins. Configuration may be made such that the counterfeit coin storage section 30' is disposed in the coin identification section 27. The coin identification section 27 outputs identification result data related to the identification results to the controller 21. Inserted banknotes and inserted coins are referred to below collectively as "inserted currency". The counterfeit banknote storage section 29' and the counterfeit coin storage section 30' are similarly referred to collectively as "counterfeit currency storage section". Counterfeit banknotes and counterfeit coins are similarly referred to collectively as "counterfeit currency".

The storage processor 28 stores inserted banknotes that have been conveyed from the banknote depositing and dispensing section 24 in the banknote storage section 29, and stores inserted coins that have been conveyed from the coin deposit and dispensing section 26 in the coin storage section 30. Specifically, the banknote storage section 29 is provided one for each currency unit. For example, a banknote storage section 29*a* corresponds to US dollars, a banknote storage section 29*b* corresponds to Japanese yen, a banknote storage section 29*c* corresponds to Brazilian real (BRL), and a banknote storage section 29*d* corresponds to euros (EUR). There are four banknote storage sections 29 illustrated in FIG. 2; however, obviously configuration may be made with more or less than this number of banknote storage sections 29. Each of the banknote storage sections 29 has storage cassette(s) corresponding to each denomination of banknote. The storage processor 28 therefore first selects the banknote storage section 29 corresponding to the currency unit of the inserted banknote, and then selects the storage cassette corresponding to the denomination of the inserted banknote from the storage cassettes of the selected banknote storage section 29. The banknote storage section 29 stores the inserted banknote in the selected storage cassette. When in receipt of a dispensing instruction from the controller 21, the storage processor 28 takes out the banknote(s) from the storage cassette as designated by the controller 21, and places the banknote(s) on the banknote conveying path. Note that configuration may be made such that one banknote storage section 29 is provided for depositing, and one banknote storage section 29 is provided for dispensing. Such dispensing banknote storage sections 29 are provided one for each currency unit, similarly to as described above. In such configurations, the storage processor 28 stores inserted banknotes in the deposit banknote storage section 29. Dispensing is performed similarly to as described above.

In this example, the coin storage section 30 is common to all the currency units. Namely, the storage processor 28 stores all the inserted coins in the coin storage section 30. However,

obviously a similar configuration to that of the banknote storage sections **29** may also be adopted for coin storage sections **30**.

The storage processor **28** stores forgeries (counterfeit banknotes) that have been conveyed from the banknote depositing and dispensing section **24** in the counterfeit banknote storage section **29'**, and stores counterfeit coins that have been conveyed from coin deposit and dispensing section **26** in the counterfeit coin storage section **30'**.

The communication section **31** performs communication with a server **50** through a network **40**, and thereby acquires various types of data from the server **50**, such as rate data for each of the currency units. The communication section **31** stores rate data acquired from the server **50** in the storage unit **20**. The server **50** computes rates for each currency unit corresponding to the installation location of the automated transaction apparatus **10** and stores the computation results. When a rate is requested by the automated transaction apparatus **10**, the server **50** transmits the stored rate to the automated transaction apparatus **10**. Further, the server **50** also stores account numbers and respective PINs, associated with each other.

2. Processing Sequence of Automated Transaction Apparatus

Explanation follows regarding a processing sequence with the automated transaction apparatus **10**, with reference to the flow charts of FIG. **3** to FIG. **8**. In parallel to the following processing, the controller **21** also provides rates corresponding to the installation location of the automated transaction apparatus **10** to the rate providing section **12** for each of the currency units. The communication section **31** periodically requests rate data from the server **50**, and stores in the storage unit **20** rate data that has been transmitted in response from the server **50**.

Overall Processing

Explanation first follows regarding overall processing performed by the automated transaction apparatus **10**, with reference to FIG. **3**. At step S**10**, the controller **21** performs standby processing. For example, the controller **21** displays a standby image on the transaction information providing section **17**. The standby image displays, for example, guidance prompting a user to insert a cash card. As well as guidance, the standby image may also be configured to display a transaction selection button P**2** for "Exchange", as described later. The controller **21** transitions to the exchange transaction, as described later, when the user touches the transaction selection button P**2** for "Exchange".

At step S**20**, the card processor **23** determines whether or not a cash card has been inserted into the card input-output port **14**. Processing proceeds to step S**30** when it is determined that a cash card has been inserted; however, processing returns to step S**10** when it is determined that no cash card has been inserted.

At step S**30**, the card processor **23** reads in various types of data from the cash card that has been inserted through the card input-output port **14**, such as for example the account name, account number, PIN, currency unit of the currency deposited in the account (referred to below as "account currency unit").

At step S**40**, the card processor **23** outputs the read data, namely the cash card data, to the controller **21**. The controller **21** stores the cash card data in the storage unit **20** and causes a language selection screen such as illustrated in FIG. **9** to be displayed on the transaction information providing section **17**. The language selection screen includes plural language selection buttons P**1** and a cancel button P**100**. Characters indicating the different languages are depicted on each of the language selection buttons P**1**. The cancel button P**100** is a button for the user to cancel the transaction. The language selection screen illustrated in FIG. **9** has language selection buttons P**1** for "Japanese", "English", "French" and "Chinese"; however, obviously the configuration may include language selection buttons P**1** corresponding to other languages.

The user may touch the language selection button P**1** corresponding to the desired language from the language selection buttons P**1**. However, if the user wishes to cancel the transaction, the user may touch the cancel button P**100**. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. The controller **21** thereby ascertains the language the user has selected, or whether the transaction has been cancelled. The controller **21** proceeds to step S**50** when ascertained that the user has selected a language. From step **50** onwards, the controller **21** provides various types of data to the transaction information providing section **17** in the language selected by the user. However, when ascertained that the transaction has been cancelled, the controller **21** outputs card return data to the card processor **23** and based on the card return data the card processor **23** returns the cash card through the card input-output port **14**. The controller **21** then returns to step S**10**. In the processing described below, similar processing to the above is performed whenever the user presses the cancel button P**100**.

At step S**50**, the controller **21** provides various transaction cautions to the transaction information providing section **17**.

At step S**60**, the controller **21** receives an input of PIN. Specifically, the controller **21** displays a ten-key on the transaction information providing section **17**. The user may then input their PIN by touching the ten-key. The input section **18** outputs PIN data relating to the input PIN to the controller **21**. The controller **21** outputs PIN interrogation data, in which PIN data and respective account number data associated with each other, to the communication section **31**. The communication section **31** transmits the PIN interrogation data to the server **50**. The server **50** determines whether the PIN that has been input by the user is correct based on the PIN interrogation data (namely whether the PIN matches the PIN stored in the server **50**). The server **50** transmits determination result data related to the determination result to the automated transaction apparatus **10**, and the communication section **31** outputs the received determination result data to the controller **21**. The controller **21** determines whether the PIN that has been input by the user is correct based on the determination result data, and the processing proceeds to step S**70** when the PIN is determined to be correct, and the processing of S**60** is repeated when the PIN is determined to be incorrect. Configuration may be made such that data of associated account numbers and PINs are stored in the storage unit **20**. In such cases, the controller **21** can determine whether or not the PIN is correct based on such data stored in the storage unit **20**.

At step S**70**, the controller **21** causes a transaction selection screen such as that illustrated in FIG. **10** to be displayed on the transaction information providing section **17**. The transaction selection screen includes plural transaction selection buttons P**2** and a cancel button P**100**. Characters indicating the type of transaction are depicted on the transaction selection buttons P**2**. The user may touch the transaction selection button P**2** corresponding to the desired transaction from out of the transaction selection buttons P**2**. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. The controller **21** thereby ascertains the transaction that has been selected by the user. The controller **21** then proceeds to step S**80** when the transaction selected by the user has been ascertained. The transaction selection screen illustrated in FIG. **10** includes transaction selection buttons P**2** corresponding to "Dispense", "Exchange",

"Deposit", and "Wire Transfer" as the transaction selection buttons P2. However, obviously transaction selection buttons P2 corresponding to other transactions may be included in the transaction selection buttons P2. At step S80, the controller 21 proceeds to the transaction that has been selected by the user.

Dispensing Transaction

Explanation follows regarding a dispensing transaction performed by the automated transaction apparatus 10, with reference to FIG. 4. The dispensing transaction is performed when a user has selected "Dispense".

At step S90, the controller 21 causes a dispensing amount selection screen such as that illustrated in FIG. 11 to be displayed on the transaction information providing section 17. The dispensing amount selection screen includes a dispensing amount display area P3, a dispensing banknote selection button P4, a confirmation button (OK button) P11, and a cancel button P100. Dispensing banknotes (namely the banknotes to be dispensed) and the dispensing note number (namely the number of banknotes to be dispensed) are displayed in association with each other in the dispensing amount display area P3. The present example shows the dispensing banknotes as 200 Brazilian real, 10000 Japanese yen, 100 US dollars, and 100 euros, and the dispensing note numbers are respectively "n_1" to "n_4" (wherein n_1 to n_4 are integers of 0 or greater). Characters indicating the type of dispensing banknote are depicted on the dispensing banknote selection button P4. The dispensing amount selection image illustrated in FIG. 11 includes the dispensing banknote selection buttons P4 corresponding respectively to "200 Brazilian Real", "10000 Japanese yen", "100 US dollars" and "100 euros"; however, obviously dispensing banknote selection buttons P4 may be included that correspond to other dispensing banknotes.

The user then touches the desired dispensing banknote selection button P4. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains the dispensing banknotes that have been selected by the user, and increments by 1 the dispensing note number corresponding to the identified dispensing banknote. The controller 21 associates and stores the dispensing banknote and the dispensing note number in the storage unit 20.

The confirmation button P11 is a button for the user to confirm the dispensing amount. The user may touch the confirmation button P11 when the user wishes to confirm the dispensing amount. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. Based on the operation data, the controller 21 thereby ascertains that the user has confirmed the dispensing amount.

At step S100, the controller 21 determines whether the user has touched a button based on the operation data. The controller 21 proceeds to step S110 when it is determined that the user has touched the confirmation button P11, and proceeds to step S111 when it is determined that the user has touched the cancel button P100.

At step S110, the controller 21 acquires rate data and cash card data from the storage unit 20, and, based on the acquired data, computes the rate in the account currency unit for the dispensing currency unit that is the currency unit of the dispensing banknotes. The controller 21 then computes an individual dispensing amount by multiplying the dispensing banknote denomination by the computed rate and by the respective dispensing note number. The controller 21 computes individual dispensing amounts for all of the dispensing banknotes, and then computes the account deduction amount by adding the computed individual dispensing amounts together. The controller 21 then deducts (withdraws) currency of the account deduction amount from the account of the user.

The controller 21 then outputs dispensing data relating to the dispensing banknotes and the dispensing note number to the storage processor 28. The storage processor 28 takes out from the banknote storage section 29 dispensing banknotes up to the dispensing note number and places them on the banknote conveying path. The banknote depositing and dispensing section 24 conveys the banknote(s) on the banknote conveying path to the banknote input-output port 15, and ejects (dispenses) the banknotes from the banknote input-output port 15. The controller 21 outputs to the document processor 22 receipt issue instruction data including data related to the dispensing banknotes, the dispensing note number and the account deduction amount. The document processor 22 then issues a receipt on which the dispensing banknotes, the dispensing note number, and the account deduction amount are written, and dispenses the receipt to the user. At step S111, the controller 21 outputs card return instruction data to the card processor 23, and the card processor 23 returns the cash card to the user based on the card return instruction data. The controller 21 then ends dispensing processing.

Modified Example of Dispensing Transaction

Explanation follows regarding a modified example of the dispensing transaction. At step S90 in the modified example, the controller 21 displays a dispensing amount selection screen such as that illustrated in FIG. 12. In the present example, the dispensing amount selection screen includes currency unit selection buttons P5, a dispensing amount display area P6, a confirmation button P11, a cancel button P100, and a ten key, which is not shown in the drawings. Characters indicating the type of currency unit are depicted on the currency unit selection buttons P5. The dispensing amount selection screen illustrated in FIG. 12 includes currency unit selection buttons P5 corresponding to "Brazilian real", "US dollar", "Japanese yen" and "Euro"; however, obviously currency unit selection buttons P5 that correspond to other currency units may be included. The dispensing amount display area P6 displays the user dispensing amount, namely, the monetary amount of the currency to be dispensed to the user.

The user may touch the desired currency unit selection button P5. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains a selected currency unit that has been selected by the user. The user may input a desired value by touching the ten key. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains a dispensing amount reference value that is the value that has been input by the user. The controller 21 identifies a monetary amount of the dispensing amount reference value expressed by the selected currency unit as the user dispensing amount, and determines whether it is possible to dispense the user dispensing amount completely in banknotes. The controller 21 stores the user dispensing amount in the storage unit 20 when, as a result of determination, the controller 21 determines that it is possible to dispense the user dispensing amount completely in banknotes. The controller 21 also causes the user dispensing amount to be displayed in the dispensing amount display area P6. However, when the controller 21 has determined that it is not possible to dispense at least a portion of the user dispensing amount in banknotes, the controller 21 discards the dispensing amount reference value and displays that a portion of the user dispensing amount cannot be dispensed in banknotes in the dispensing

amount display area P6. The controller **21** thereby prompts the user to re-input a dispensing amount reference value. The confirmation button P11 is similar to that explained with respect to FIG. **11**.

At step S100, the controller **21** determines which button the user has touched based on the operation data. The controller **21** proceeds to step S110 when it is determined that the user has touched the confirmation button P11, and proceeds to step S111 when it is determined that the user has touched the cancel button P100.

At step S110, the controller **21** acquires rate data and cash card data from the storage unit **20** and computes a rate in the account currency unit for the selected currency unit based on the acquired data. The controller **21** then computes an account deduction amount by multiplying the user dispensing amount by the computed rate. The controller **21** deducts currency of the account deduction amount from the account of the user.

The controller **21** outputs dispensing data relating to the user dispensing amount to the storage processor **28**. The storage processor **28** takes out banknote(s) corresponding to the selected currency unit up to the user dispensing amount from the banknote storage section **29** and places the banknotes on the banknote conveying path. The banknote depositing and dispensing section **24** conveys the banknotes on the banknote conveying path to the banknote input-output port **15**, and ejects (dispenses) the banknotes from the banknote input-output port **15**. The controller **21** also outputs receipt issue instruction data including data related to the user dispensing amount and the account deduction amount. The document processor **22** then issues a receipt on which such items as the user dispensing amount and the account deduction amount are written, and dispenses the receipt to the user. At step S111, the controller **21** outputs card return instruction data to the card processor **23**, and the card processor **23** returns the cash card to the user based on the card return instruction data. The controller **21** then ends dispensing processing.

Deposit Transaction

Explanation follows regarding a deposit transaction performed by the automated transaction apparatus **10**, with reference to FIG. **5**. A deposit transaction is performed when a user has selected "Deposit".

At step S120, the banknote depositing and dispensing section **24** and the coin deposit and dispensing section **26** receive currency inserted by the user. Specifically, the banknote depositing and dispensing section **24** and the coin deposit and dispensing section **26** open the banknote input-output port **15** and the coin input-output port **16**. The user may then insert banknotes as desired into the banknote input-output port **15**. When doing so, the user may insert plural types of banknote of mutually different currency units all at once. The user may also insert coins as desired into the coin input-output port **16** when the user desires to perform coin depositing. The user may also insert plural types of coins of mutually different currency unit all at once.

At step S130, the banknote depositing and dispensing section **24** closes the banknote input-output port **15** after banknotes have been inserted into the banknote input-output port **15**, and then conveys the inserted banknotes to the banknote identification section **25**. The banknote identification section **25** identifies the currency unit and denomination of each of the inserted banknotes on the conveying path. The banknote identification section **25** ascertains the inserted banknotes to be forgeries if the banknote identification section **25** is unable to ascertain the currency unit and/or denomination of any of the inserted banknotes. The banknote identification section **25** outputs identification result data related to the identification results to the controller **21**.

The coin deposit and dispensing section **26** closes the coin input-output port **16** after coins have been inserted into the coin input-output port **16**, and conveys the inserted coins to the coin identification section **27**. The coin identification section **27** identifies the currency unit and denomination of each of the inserted coins on the conveying path. The coin identification section **27** ascertains the inserted coins to be counterfeit coins when the coin identification section **27** is unable to ascertain the currency unit and/or denomination of any of the inserted coins. The coin identification section **27** outputs identification result data related the identification results to the controller **21**.

At step S140, the controller **21** determines whether or not there is any counterfeit currency present based on the identification result data input from the banknote identification section **25** and the coin identification section **27**. The controller **21** proceeds to step S150 if it is determined that there is counterfeit currency present, and proceeds to step S170 if it is determined that there is no counterfeit currency present.

At step S150, the controller **21** determines a type of processing for the counterfeit currency separately for each currency unit of counterfeit currency based on the counterfeit currency processing table. For example, the controller **21** determines the type of processing for the counterfeit currency as "retain" when the currency unit of the counterfeit currency is Euro, and determines the type of processing for the counterfeit currency "return" when the currency unit of the counterfeit currency is anything other than Euro.

At step S160, the controller **21** executes the processing that has been determined at step S150. Specifically, the controller **21** outputs retain instruction data to the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** when "retain" has been selected as the processing for the counterfeit currency. The banknote depositing and dispensing section **24** and the coin deposit and dispensing section **26** then convey the counterfeit currency to the storage processor **28** based on the retain instruction data. The storage processor **28** stores the counterfeit currency in the corresponding storage section. Namely, the storage processor **28** stores counterfeit banknotes in the counterfeit banknote storage section **29'** and counterfeit coins in the counterfeit coin storage section **30'**.

However, when "return" has been selected as the type of processing for the counterfeit currency, the controller **21** outputs return instruction data to the banknote depositing and the dispensing section **24** and/or the coin deposit and dispensing section **26**. The banknote depositing and dispensing section **24** and the coin deposit and dispensing section **26** return the counterfeit currency from the banknote input-output port **15** and/or the coin input-output port **16** based on the return instruction data. Configuration may be made such that when counterfeit currency is present, the controller **21** notifies the user that counterfeit currency is present and notifies the user of the type of processing for the counterfeit currency. For example, the controller **21** may generate text information such as "Counterfeit currency detected. Retaining counterfeit currency" to be presented on the transaction information providing section **17**.

The controller **21** may also be configured so as to allow the user to select a type of processing for the counterfeit currency. In such cases, the controller **21** causes a counterfeit currency processing selection screen such as that illustrated in FIG. **13** to be displayed at step S150. The counterfeit currency processing selection screen includes a text image P17 for notifying the presence of counterfeit currency, a retain selection

button P8, and a return selection button P9. The retain selection button P8 is a button for selecting "retain" as the type of processing for the counterfeit currency. The return selection button P9 is a button for selecting "return" as the type of processing for the counterfeit currency. The user can be made aware that there is counterfeit currency in the inserted currency by viewing the screen. The user may then touch the button corresponding to the desired processing, from the retain selection button P8 and the return selection button P9. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**.

At step S**160**, the controller **21** then performs the processing that has been selected by the user based on the operation data. Specifically, the controller **21** outputs retain instruction data to the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** if "retain" has been selected by the user as the type of processing for the counterfeit currency. The banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** then convey the counterfeit currency to the storage processor **28** based on the retain instruction data. The storage processor **28** then stores the counterfeit currency in the corresponding storage section. The storage processor **28** stores counterfeit banknotes in the counterfeit banknote storage section **29'** and counterfeit coins in the counterfeit coin storage section **30'**.

If the user has selected "return", the controller **21** outputs return instruction data to the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26**. The banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** then return the counterfeit currency from the banknote input-output port **15** and/or the coin input-output port **16** based on the return instruction data. Configuration may be made such that when there are plural items of counterfeit currency present, the controller **21** allows the user to select how the counterfeit currency items are to be handled all at once, or allows the user to select how to handle each of the counterfeit currency items separately.

At step S**170**, based on the determination result data the controller **21** then causes a deposit result screen such as that illustrated in FIG. **14** to be displayed. The deposit result screen includes a deposit currency display area P**10** for displaying the inserted currency and the number of items of inserted currency (individual number), a confirmation button P**11** and a cancel button P**100**. In this example, there are n_1 notes of 200 Brazilian real, n_2 notes of 10000 Japanese yen, n_3 notes of 100 US dollar, and n_4 notes of 100 euros inserted. The user may touch the confirmation button P**11** unless they disagree with the content displayed, and may touch the cancel button P**100** to cancel the transaction. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**.

At step S**180**, the controller **21** determines which button the user has pressed based on the operation data. The controller **21** proceeds to step S**190** when it is determined that the user has touched the confirmation button P**11**, and proceeds to step S**191** when it is determined that the user has touched the cancel button P**100**.

The controller **21** performs deposit processing at step S**190**. Specifically, the controller **21** outputs conveying instruction data to the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26**. Based on the conveying instruction data, the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** then convey the inserted currency that is temporarily being held in the banknote identification section **25** and/or the coin identification section **27** to the storage processor **28**. The storage processor **28** stores the inserted currency in the banknote storage section **29** and/or the coin storage section **30**.

The controller **21** also acquires rate data and cash card data from the storage unit **20**. Based on the acquired data, the controller **21** then computes a rate in the account currency unit against the currency unit of the inserted currency (a monetary amount in the account currency unit for a unit amount of the inserted currency). The controller **21** computes a deposit amount by multiplying the computed rate with the inserted currency amount, and deposits currency of the value of the deposit amount into the account of the user. The controller **21** outputs receipt issue instruction data including data related to the deposit amount to the document processor **22**. The document processor **22** issues a receipt on which items such as the deposit amount are written, and dispenses the receipt to the user. The controller **21** also outputs card return instruction data to the card processor **23**, and the card processor **23** then returns the cash card to the user based on the card return instruction data. The controller **21** then ends deposit processing. Configuration may be made such that the controller **21** performs the following processing instead of depositing currency of the value of the deposit amount in the account of the user. The controller **21** outputs prepaid card issue instruction data including data related to the deposit amount to the document processor **22**. The document processor **22** takes a prepaid card from a prepaid card storage section, stores data relating to the deposit amount on the prepaid card, and dispenses the prepaid card to the user. The user is then able to take the prepaid card to a financial institution such as a bank and exchange the prepaid card value for cash.

At step S**191**, the controller **21** outputs card return instruction data to the card processor **23**, and currency return instruction data to the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26**. The card processor **23** returns the cash card to the user based on the card return instruction data. Based on the currency return instruction data, the banknote depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** return the inserted currency that is being temporarily held in the banknote identification section **25** and/or the coin identification section **27** to the user. Configuration may be made such that, for example, for the value of the coin amount of inserted currency, the controller **21** returns this amount to the user using a prepaid card such as that referred to above. Processing of the storage processor **28** is simplified by adopting such a configuration. The controller **21** then ends deposit processing.

Exchange Transaction

Explanation follows regarding an exchange transaction performed by the automated transaction apparatus **10**, with reference to FIG. **6**. Exchange transactions are performed when a user has selected "Exchange". In outline, an exchange transaction is a transaction in which a source exchange currency that is the inserted currency is swapped (exchanged) for a target exchange currency that is a currency of different currency unit to that of the exchange currency. In the following, the currency unit of the source exchange currency is referred to as the "source exchange currency unit", and the currency unit of the target exchange currency is referred to as the "target exchange currency unit".

At step S**200**, the document processor **22** determines whether or not a passport has been inserted into the document input-output port **13**. Processing proceeds to step S**210** when it is determined that a passport has been inserted into the document input-output port **13**. However, when it is determined that a passport has not yet been inserted into the docu-

ment input-output port **13**, passport non-insertion data expressing the lack of passport insertion is output to the controller **21**. When in receipt of passport non-insertion data, the controller **21** determines, as source exchange currency unit candidates, the currency units the automated transaction apparatus **10** is capable of handling (the currency units stored in the banknote storage section **29**). The controller **21** then proceeds to step S**230**.

At step S**210**, the document processor **22** reads in at least nationality data relating the nationality of the user from the data stored on the passport, and outputs the read data to the controller **21**. The controller **21** stores the nationality data in the controller **21**, and based on the nationality data, the controller **21** ascertains the user's national currency unit that is the currency unit employed in the country of the user's nationality.

At step S**220**, the controller **21** determines an installation location currency unit that is the currency unit in the region where the automated transaction apparatus **10** is installed and the user's national currency unit as target exchange currency unit candidates.

At step S**230**, the controller **21** causes an exchange currency selection screen such as illustrated in FIG. **15** to be displayed on the transaction information providing section **17**. The exchange currency selection screen includes a source exchange currency unit selection area P**12**, a target exchange currency unit selection area P**14**, a confirmation button P**11**, and a cancel button P**100**. Source exchange currency unit selection buttons P**13** are displayed in the source exchange currency unit selection area P**12**, and target exchange currency unit selection buttons P**15** are displayed in the target exchange currency unit selection area P**14**.

Characters indicating the type of the source exchange currency unit candidates are depicted on the source exchange currency unit selection buttons P**13**. The source exchange currency unit selection buttons P**13** are buttons operated by the user to select a source exchange currency unit from among the source exchange currency unit candidates. The exchange currency selection image illustrated in FIG. **15** is an example in which the source exchange currency unit candidates are "Brazilian real", "US dollar", "Japanese yen" and "Euro"; however, obviously other currency units may be employed as the source exchange currency unit candidates.

Characters indicating the type of the target exchange currency unit candidates are depicted on the target exchange currency unit selection buttons P**15**. The target exchange currency unit selection buttons P**15** are buttons operated by the user to select a target exchange currency unit from among the target exchange currency unit candidates. The exchange currency selection image illustrated in FIG. **15** is an example including "Brazilian real", "US dollar", "Japanese yen" and "Euro" as target exchange currency unit candidates.

The user may select the source exchange currency unit from the source exchange currency unit candidates by touching the desired source exchange currency unit selection button P**13**. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. The controller **21** thereby ascertains the source exchange currency unit that has been selected by the user. Similarly, the user may selects the desired target exchange currency unit from out of the target exchange currency unit candidates by touching the desired target exchange currency unit selection button P**15**. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. The controller **21** thereby ascertains the target exchange currency unit that has been selected by the user.

After selecting the source exchange currency unit and the target exchange currency unit, the user may then touch the confirmation button P**11**. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. The controller **21** thereby ascertains that the source exchange currency unit and the target exchange currency unit that have been confirmed by the user. The controller **21** then proceeds to step S**240**.

At step S**240**, the controller **21** acquires rate data from the storage unit **20** and, based on the acquired rate data, computes an exchange target rate that is a rate in the target exchange currency unit against the source exchange currency unit.

At step S**250**, the controller **21** determines whether or not the exchange target rate is within a specific range. When it is determined that the exchange target rate is within a specific range, the controller **21** proceeds to step S**260**, and when it is determined that the exchange target rate is outside of the specific range, the controller **21** outputs card return instruction data to the card processor **23**. The card processor **23** returns the cash card to the user based on the card return instruction data. The controller **21** then ends exchange transaction processing. The specific range is set for each combination of source exchange currency unit and target exchange currency unit. The width of the specific range depends on factors such as the stability of the rate of the currency. For example, a currency unit rate of low volatility has a narrower specific range than that of currency unit rate of high volatility. The reason such an approach is adopted is in consideration of the fact that distortions in rate have a greater impact on transactions for currency unit rates of low volatility.

At step S**260**, the controller **21** computes an source exchange rate that is the rate of the source exchange currency unit against the target exchange currency unit. The controller **21** also computes an input upper limit to the source exchange currency by multiplying an upper payout amount that is the upper limit of target exchange currency by the source exchange rate. The automated transaction apparatus **10** is set with an upper limit for the value of the target exchange currency it is possible to pay out for a single transaction. Such an approach is adopted since if there was no upper limit to the target exchange currency, the possibility increases of insufficient currency being stored in the automated transaction apparatus **10**, and the possibility increases of dispensing amount exceeding the number of notes that the automated transaction apparatus **10** can dispense each time.

At step S**270**, the controller **21** causes a source exchange upper limit amount display screen such as that illustrated in FIG. **16** to be displayed on the transaction information providing section **17**. The source exchange upper limit amount display screen includes an upper limit amount display area P**16** for displaying an upper limit amount for insertion. In the example illustrated in FIG. **16**, the source exchange currency unit is Japanese yen.

At step S**280**, the banknote depositing and dispensing section **24** receives banknotes inserted by the user. Specifically, the banknote depositing and dispensing section **24** opens the banknote input-output port **15**. The user inserts banknotes of the source exchange currency into the banknote input-output port **15**. The banknote depositing and dispensing section **24** then conveys the inserted banknotes to the banknote identification section **25**.

At step S**290**, the banknote identification section **25** identifies the currency unit and denomination of the inserted banknotes and outputs identification result data to the controller **21**. Based on the identification result data, the controller **21** determines whether all of the inserted banknotes are of the source exchange currency. The controller **21** proceeds to step

S300 when it has been determined that all of the inserted banknotes are of the source exchange currency. The controller **21** proceeds to step S370 when it is determined that some of the inserted banknotes are not banknotes of the source exchange currency.

At step S300, the controller **21** determines whether or not the total of the inserted banknotes exceeds the input upper limit. The controller **21** proceeds to step S310 when determined that the total of the inserted banknotes exceeds the input upper limit, and proceeds to step S320 when determined that the total of the inserted banknotes is the input upper limit or lower, while regarding all of the inserted banknotes as the source exchange currency.

At step S310, the controller **21** performs excess processing. Specifically, the controller **21** computes the amount by which the total of the inserted banknotes exceeds the input upper limit, namely computes the excess amount. The controller **21** then causes an excess amount display screen such as that illustrated in FIG. **17** to be displayed on the transaction information providing section **17**. The excess amount display screen includes an excess amount display area P17 displaying the excess amount. The controller **21** then computes the number of banknotes required to reduce the total of the inserted banknotes to the input upper limit amount or lower. The controller **21** then outputs return note number data that is the computed number of notes to the banknote depositing and dispensing section **24**. Based on the return note number data, the banknote depositing and dispensing section **24** then returns the return note number of banknotes from the inserted banknotes to the user. The controller **21** then treats as the source exchange currency an amount that is the total inserted banknotes from which an amount of the value of the return note number of banknotes has been subtracted. Configuration may be made such that when there is an excess amount to the upper limit, the controller **21** immediately halts the transaction without performing the excess processing. In such cases, the processing proceeds directly to step S370.

At step S320, the controller **21** computes the target exchange currency amount by multiplying the source exchange currency amount by the exchange target rate. The controller **21** then causes an insertion result display screen such as illustrated in FIG. **18** to be displayed on the transaction information providing section **17**. The insertion result display screen includes a source exchange currency display area P18 displaying the source exchange currency amount, a target exchange currency display area P19, a confirmation button P11 and a cancel button P100.

The user may touch the confirmation button P11 to confirm the amounts displayed for the source exchange currency and the target exchange currency. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**. However, the user may touch the cancel button P100 when the user wishes to cancel the exchange transaction. The input section **18** outputs operation data corresponding to the user's input operation to the controller **21**.

Configuration may be made such that the controller **21** outputs to the banknote depositing and dispensing section **24** data expressing information indicating that additional source exchange currency may be inserted when the source exchange currency amount is lower than the input upper limit. In such a configuration, the banknote depositing and dispensing section **24** may then receive any additional source exchange currency inserted. Processing from step S290 onwards is then repeated when new source exchange currency has been inserted. Configuration may also be made such that the controller **21** includes data relating to the exchange target rate in the insertion result display screen when the automated transaction apparatus **10** accepts additional source exchange currency. The user is accordingly made aware of how much the target exchange currency will increase if a further amount of source exchange currency is inserted. The controller **21** may also include data relating to the difference between the source exchange currency amount and the input upper limit in the insertion result display screen. The user is accordingly able to determine how much more source exchange currency it is possible to insert.

At step S330, the controller **21** determines which button the user has touched based on operation data. The controller **21** outputs conveying instruction data to the banknote depositing and dispensing section **24** when it is determined that the user has touched the confirmation button P11. Based on the conveying instruction data, the banknote depositing and dispensing section **24** then conveys the inserted banknotes that are being temporarily held in the banknote identification section **25** to the storage processor **28**. The storage processor **28** stores the inserted banknotes in the corresponding storage cassette. The controller **21** then proceeds to step S340. However, when it is determined that the user has touched the cancel button P100, the controller **21** proceeds to step S370.

At step S340, the controller **21** determines whether or not the need has arisen to pay out to the user at least a portion of the target exchange currency in coins. Examples of when such a need arises include, for example, when the target exchange currency is a monetary amount including small change, namely a monetary amount that can only be paid with coins, or when there is insufficient banknotes in the storage cassettes. An example of the former case is, for example, a target exchange currency monetary amount of JPY 20060. In this example, there is a small change amount of JPY 60.

The controller **21** proceeds to step S350 when the need arises to pay at least a portion of the target exchange currency to the user in coins; however, the controller **21** proceeds to step S360 when it is determined that the whole of the target exchange currency can be paid in notes.

At step S350, the controller **21** performs small change processing. Specifically, based on the target exchange currency amount and the state of the storage cassettes (data related to the state is provided from the storage processor **28**), the controller **21** computes a coin payment amount that is need to be paid in coins. The controller **21** then outputs coin payment data related to the coin payment amount to the card processor **23**. The card processor **23** takes a prepaid card out from a prepaid card storage section and stores the coin payment amount on the prepaid card. The card processor **23** then dispenses the prepaid card to the user. The controller **21** then treats as a new target exchange currency amount, an amount that is the previous target exchange currency amount from which the coin payment amount has been deducted.

Configuration may be made such that the card processor **23** stores the coin payment data on the cash card rather than storing the coin payment amount data on a prepaid card. Alternatively, the controller **21** may output the coin payment data to the document processor **22**, and the document processor **22** store the coin payment data on a receipt, which is described later. Such a receipt has a similar function to that of a prepaid card. The controller **21** may also be configured to output the coin payment data to the storage processor **28**. In such cases, the storage processor **28** takes coins of the coin payment amount from the coin storage section **30** based on the coin payment data, and places the coins on the coin conveying path. The coin deposit and dispensing section **26** conveys the coins to the coin input-output port **16** and pays the coins out to the user.

At step S360, the controller 21 performs exchange processing. Namely, the controller 21 outputs target exchange currency data related to the target exchange currency to the storage processor 28. Based on the target exchange currency data, the storage processor 28 then takes out banknotes corresponding to the target exchange currency from the storage cassette and places the banknotes on the banknote conveying path. The banknote depositing and dispensing section 24 conveys the banknotes on the banknote conveying path to the banknote input-output port 15 and pays the banknotes out to the user.

The controller 21 also outputs to the document processor 22 receipt issue instruction data including data related to the source exchange currency and the target exchange currency. The document processor 22 then issues a receipt on which such items as the source exchange currency and the target exchange currency are written, and dispenses the receipt to the user. Examples of the language of the receipt include the language of, for example, the country of the nationality of the user, a country in which the source exchange currency is in circulation, and a country that employs the target exchange currency. The controller 21 then outputs card return instruction data to the card processor 23, and the card processor 23 returns the cash card to the user based on the card return instruction data. The controller 21 then ends exchange processing.

At step S370, the controller 21 outputs card return instruction data to the card processor 23, and the card processor 23 returns the cash card to the user based on the card return instruction data. The controller 21 also outputs banknote return data to the banknote depositing and dispensing section 24. Based on the banknote return data, the banknote depositing and dispensing section 24 returns the inserted currency that is being temporarily held by the banknote identification section 25, that is the source exchange currency, to the user. The controller 21 then ends exchange processing.

Modified Example of Exchange Processing

Explanation follows regarding a modified example of exchange processing, with reference to FIG. 7. The automated transaction apparatus 10 performs at step S380 to step S400 similar processing to that of step S200 to step S220 illustrated in FIG. 6.

At step S410, the controller 21 causes an exchange currency selection screen such as that illustrated in FIG. 19 to be displayed on the transaction information providing section 17. The exchange currency selection screen includes a target exchange currency unit selection button P15, a confirmation button P11 and a cancel button P100. In this modified example, the user may select only the target exchange currency unit.

The user may select the desired target exchange currency unit from the target exchange currency unit candidates by touching the desired target exchange currency unit selection button P15. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains the target exchange currency unit that has been selected by the user.

After selecting the target exchange currency unit, the user may then touch the confirmation button P11. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains that the user has confirmed the target exchange currency unit. The controller 21 then proceeds to step S420.

At step S420, the banknote depositing and dispensing section 24 receives banknotes inserted by the user. Specifically, the banknote depositing and dispensing section 24 opens the banknote input-output port 15. The user may insert banknotes of the source exchange currency into the banknote input-output port 15. When this is performed, the user may insert plural types of banknotes of mutually different currency units all at once. The banknote depositing and dispensing section 24 conveys the inserted banknotes to the banknote identification section 25.

The banknote identification section 25 identifies the currency unit and denomination of the inserted banknotes, and outputs identification result data to the controller 21. The controller 21 thereby ascertains the source exchange currency unit and source exchange currency amount based on the identification result data. The controller 21 then acquires rate data from the storage unit 20, and computes an exchange target rate that is a rate of the target exchange currency unit against the source exchange currency unit.

The automated transaction apparatus 10 performs similar processing at step S430 to step S530 to that of the processing of step S250 to step S270 and step S300 to step S370 illustrated in FIG. 6. Configuration may be made such that the controller 21 can receive cancellation from the user separately for each of the source exchange currency units during processing of step S500.

Transfer Processing

Explanation follows regarding wire transfer, with reference to FIG. 8. At step S540, the controller 21 prompts a user to input an account, which is a wire transfer destination. For example, the automated transaction apparatus 10 may display a list of transaction enabled financial institutions, together with a ten-key, on the transaction information providing section 17.

At step S550, the controller 21 then causes a transfer currency designation screen such as that illustrated in FIG. 20 to be displayed on the transaction information providing section 17. The transfer currency designation screen includes transfer currency unit selection buttons P21, a transfer amount display area P22, a confirmation button P11 and a cancel button P100, and the ten-key, which is not shown in the drawings. Characters indicating types of transfer currency unit are depicted on the transfer currency unit selection buttons P21. The transfer currency designation screen illustrated in FIG. 20 includes transfer currency unit selection buttons P21 corresponding to "Brazilian real", "US dollar", "Japanese yen" and "Euro" as the transfer currency unit selection buttons P21; however, obviously the transfer currency unit selection buttons P21 may include buttons corresponding to other currency units than these. The monetary amount to be transferred to the user designated account, namely the transfer amount is displayed in the transfer amount display area P22.

The user may touch the desired transfer currency unit selection button P21. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains the selected transfer currency unit that is selected by the user. The user may also input a desired value by touching the ten-key. The input section 18 outputs operation data corresponding to the user's input operation to the controller 21. The controller 21 thereby ascertains a transfer reference value that is the value input by the user. The controller 21 determines the wire transfer reference value expressed in the selected transfer currency unit as a transfer amount. The controller 21 stores the transfer amount in the storage unit 20. The controller 21 displays the transfer amount in the transfer amount display area P22.

At step S560, the depositing and dispensing section 24 and/or the coin deposit and dispensing section 26 receive currency inserted by the user. Specifically, the banknote input-output port 15 and the coin input-output port 16 are opened. The user may insert banknotes as desired into the

banknote input-output port **15**. When doing so the user may insert plural types of banknote of mutually different currency unit all at once. When the user wishes to deposit coins, the user may also insert coins into the coin input-output port **16**. The user may also insert plural types of coin of mutually different currency unit all at once. The depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** convey the inserted banknotes and/or the inserted coins to the banknote identification section **25** and/or the coin identification section **27**. The banknote identification section **25** and/or the coin identification section **27** verify the currency unit and denomination for each of the inserted banknotes and each of the inserted coins, and output identification result data to the controller **21**.

At step S**570**, the controller **21** performs transfer processing. Specifically, based on the identification result data and rate data stored in the storage unit **20**, the controller **21** determines whether or not the total of the inserted banknotes and the inserted coins (as converted into the transfer currency unit) matches the transfer amount. When the total of the inserted banknotes and the inserted coins matches the transfer amount, the controller **21** transfers the transfer amount to the account designated by the user. The depositing and dispensing section **24** and/or the coin deposit and dispensing section **26** also convey the inserted banknotes and inserted coins to the storage processor **28**. The storage processor **28** stores the inserted banknotes and inserted coins in the banknote storage section **29** and/or the coin storage section **30**. The controller **21** returns the cash card and issues a receipt, before ending the transfer processing. However, when the total of the inserted banknotes and the inserted coins does not match the transfer amount, the controller **21** returns the cash card, returns the inserted banknotes and inserted coins, and ends the transfer processing.

As described above, the automated transaction apparatus **10** identifies the inserted currency that has been inserted by a user when plural types of currency of mutually different currency unit have been inserted, and performs transactions with the user based on the identification result. The automated transaction apparatus **10** can accordingly perform transactions using more varieties of currencies than previously.

When counterfeit currency is included in the inserted currency, the automated transaction apparatus **10** determines a type of processing for the counterfeit currency based on the currency unit of the counterfeit currency, and the processing can be performed according to the legal framework of the country in which the currency unit of the counterfeit currency is in circulation.

Specifically, when the currency unit of the counterfeit currency is euro, the automated transaction apparatus **10** determines the type of processing for the counterfeit currency as "retain", and when the currency unit of the counterfeit currency is other currency unit than euro, the automated transaction apparatus **10** determines the type of processing for the counterfeit currency as "return". The automated transaction apparatus **10** can thereby perform processing according to the legal framework of the euro region (for example "EC Council Regulation 1338, Article-6"). Further, since the automated transaction apparatus **10** determines a type of processing for counterfeit currency based on the counterfeit currency processing table, and it can rapidly and accurately determine the processing to be employed for the counterfeit currency. The counterfeit currency processing table may be alternatively stored on the server **50**.

The automated transaction apparatus **10** can be further configured such that when there is counterfeit currency in the inserted currency, a user can select the processing for the counterfeit currency from among returning the counterfeit currency or retaining the counterfeit currency. For example, the user can select processing conforming to the legal framework of the region where the automated transaction apparatus **10** is installed.

Furthermore, when a need arises to pay at least a portion of the target exchange currency in coins, the automated transaction apparatus **10** issues a user with a prepaid card or cash card stored with data relating to the coin payment amount. The user can accordingly receive payment of the coins by taking the prepaid card or the cash card to a financial institution.

When the monetary amount of the inserted currency has exceeded the input upper limit, the automated transaction apparatus **10** cancels exchange transactions for at least the portion of the inserted currency exceeding the input upper limit. Consequently, the automated transaction apparatus **10** can terminate a transaction if a user inserts currency of an amount exceeding the input upper limit.

Further, since the automated transaction apparatus **10** can display the input upper limit, the user can easily ascertain the input upper limit.

Note that while detailed explanation has been given above exemplary embodiments with reference to the attached drawings, embodiments of the present invention is not limited thereby. It would be clear to a person of normal skill in the art that there are various examples of modifications and improvements falling within the conceivable technical scope as defined by the claims. Obviously, these modifications and improvements are within to the technical scope of the present invention. For example, the counterfeit currency processing performed in the deposit transaction (the processing of step S**130** to step S**160**) may also be performed in other transactions. The automated transaction apparatus **10** may also be employed for various transactions other than relating to cash such as, for example, for buying and selling tickets for travel on a public transport system.

What is claimed is:

1. An automated transaction apparatus comprising:

a currency depositing and dispensing section that deposits and dispenses a coin and/or a banknote, and that controls a currency input-output port;

an identification section that, after a plurality of types of currency having mutually different currency units have been inserted, identifies the inserted currency, and that ascertains whether or not the inserted currency is counterfeit currency; and

a controller that effects control of a transaction with a user based on identification results determined by the identification section, and that selects a different type of processing for each currency unit of the counterfeit currency if the inserted currency has been ascertained to be counterfeit currency;

wherein the identification section outputs the identification results to the controller;

wherein, based on the currency unit of the counterfeit currency, the controller effects control to determine the type of processing for each currency unit of the counterfeit currency as either:

returning the counterfeit currency to the user; or

retaining the counterfeit currency in a counterfeit currency storage section for storing counterfeit currency;

wherein the controller outputs retain instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as retaining the counterfeit currency in the counterfeit currency storage section based on the identification results, and the controller outputs

return instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as returning the counterfeit currency to the user based on the identification results; and

wherein the currency depositing and dispensing section conveys the counterfeit currency to the counterfeit currency storage section according to the retain instruction data, and the currency depositing and dispensing section returns the counterfeit currency from the currency input-output port to the user according to the return instruction data.

2. The automated transaction apparatus of claim **1**, further comprising a storage unit that stores a counterfeit currency processing table in which currency units of counterfeit currencies are stored in association with types of processing for each of the currency units of counterfeit currencies.

3. The automated transaction apparatus of claim **2**, wherein the controller determines the type of processing for the counterfeit currency based on the counterfeit currency processing table stored by the storage unit.

4. The automated transaction apparatus of claim **1**, further comprising:

a medium processing section,

wherein the controller effects control to exchange the inserted currency for a target exchange currency that is currency of a different currency unit to the currency unit of the inserted currency; and

wherein the medium processing section, if the user is to be paid coins for at least a portion of the target exchange currency, receives data relating to the monetary amount to be paid in coins from the controller, records the data on a recording medium, and provides the user with the recording medium.

5. The automated transaction apparatus of claim **4**, wherein the controller computes an input upper limit of the inserted currency based on a payout upper limit that is an upper limit for possible payouts of the target exchange currency and is based on a rate of the target exchange currency against the inserted currency; and, if a monetary amount of the inserted currency exceeds the input upper limit, effects control to cancel exchange of at least a portion of the inserted currency that exceeds the input upper limit.

6. The automated transaction apparatus of claim **5**, wherein the controller effects control to present the input upper limit to the user.

7. The automated transaction apparatus to claim **1**, wherein the controller causes the counterfeit currency to be conveyed to different locations according to the currency unit of the counterfeit currency.

8. The automated transaction apparatus to claim **1**, wherein the identification section ascertains that the inserted currency is a counterfeit currency if at least one of its currency unit or denomination cannot be identified.

9. The automated transaction apparatus to claim **1**, wherein the controller effects control so as to exchange the inserted currency for a target exchange currency that is a currency of a different currency unit to the currency unit of the inserted currency, and so as to display candidates for the target exchange currency based on read information of a passport.

10. An automated transaction method comprising:

after a plurality of types of currency with mutually different currency units for different usable regions have been inserted in a currency input-output port controlled by a currency depositing and dispensing section that deposits and dispenses a coin and/or a banknote, identifying the inserted currency and ascertaining whether or not the inserted currency is counterfeit currency;

outputting a result of the identification to a controller;

controlling by the controller a transaction with a user based on the identification results, and selecting a different type of processing for each currency unit of the counterfeit currency if the inserted currency has been ascertained to be counterfeit currency;

wherein the controlling comprises determining, based on the currency unit of the counterfeit currency, the type of processing for each currency unit of the counterfeit currency as either:

returning the counterfeit currency to the user; or

retaining the counterfeit currency in a counterfeit currency storage section for storing counterfeit currency;

wherein the controlling comprises outputting retain instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as retaining the counterfeit currency in the counterfeit currency storage section based on the identification results, and the controlling comprises outputting return instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as returning the counterfeit currency to the user based on the identification results; and

wherein the automated transaction method further comprising:

conveying, by currency depositing and dispensing section, the counterfeit currency to the counterfeit currency storage section according to the retain instruction data, and

returning, by the currency depositing and dispensing section, the counterfeit currency from the currency input-output port to the user according to the return instruction data.

11. The automated transaction method of claim **10**, further comprising storing a counterfeit currency processing table in which currency units of counterfeit currencies are stored in association with types of processing for each of the currency units of counterfeit currencies.

12. The automated transaction method of claim **11**, wherein the controlling comprises determining the type of processing for the counterfeit currency based on the stored counterfeit currency processing table.

13. The automated transaction method of claim **10** wherein the controlling comprises exchanging by a medium processing section the inserted currency for a target exchange currency that is currency of a different currency unit to the currency unit of the inserted currency; and, wherein the exchanging comprises:

if the user is to be paid coins for at least a portion of the target exchange currency, receiving data relating to the monetary amount to be paid in coins from the controller,

recording the data on a recording medium, and

providing the user with the recording medium.

14. The automated transaction method of claim **13** wherein the controlling comprises computing an input upper limit of the inserted currency based on a payout upper limit that is an upper limit for possible payouts of the target exchange currency and is based on a rate of the target exchange currency against the inserted currency; and, if a monetary amount of the inserted currency exceeds the input upper limit, performing control to cancel exchange of at least a portion of the inserted currency that exceeds the input upper limit.

15. The automated transaction method of claim **14** wherein the controlling comprises presenting the input upper limit to the user.

16. A non-transitory storage medium that stores a program causing a computer to execute automated transaction processing, the automated transaction processing comprising:

after a plurality of types of currency with mutually different currency units for different usable regions have been inserted in a currency input-output port controlled by a currency depositing and dispensing section that deposits and dispenses a coin and/or a banknote, identifying the inserted currency and ascertaining whether or not the inserted currency is counterfeit currency;

outputting a result of the identification to a controller;

controlling by the controller a transaction with a user based on the identification results, and selecting a different type of processing for each currency unit of the counterfeit currency if the inserted currency has been ascertained to be counterfeit currency;

wherein, based on the currency unit of the counterfeit currency, the controlling includes determining the type of processing for each currency unit of the counterfeit currency as either:

returning the counterfeit currency to the user; or

retaining the counterfeit currency in a counterfeit currency storage section for storing counterfeit currency;

wherein the controlling comprises outputting retain instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as retaining the counterfeit currency in the counterfeit currency storage section based on the identification results, and the controlling comprises outputting return instruction data to the currency depositing and dispensing section when the controller determines the type of processing for the counterfeit currency as returning the counterfeit currency to the user based on the identification results; and

wherein the automated transaction method further comprises:

conveying, by currency depositing and dispensing section, the counterfeit currency to the counterfeit currency storage section according to the retain instruction data, and

returning, by the currency depositing and dispensing section, the counterfeit currency from the currency input-output port to the user according to the return instruction data.

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